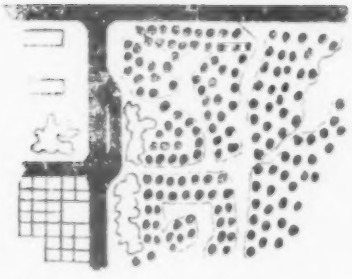
EKISTICS

ABSTRACTS ON THE PROBLEMS AND SCIENCE OF HUMAN SETTLEMENTS

ΟΙΚΙΣΤΙΚΗ

AUGUST 1960



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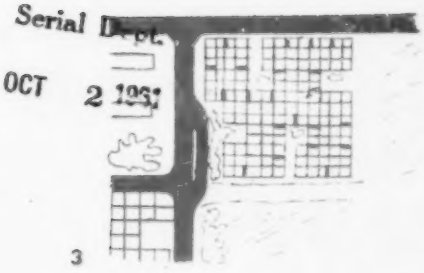

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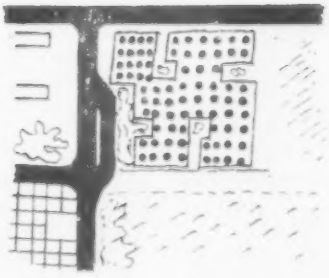

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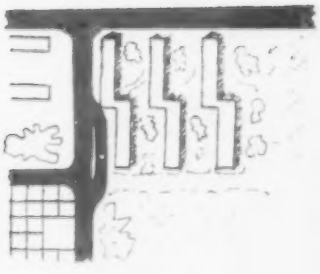

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E K I S T I C S

ABSTRACTS

of

THE PROBLEMS AND SCIENCE OF HUMAN SETTLEMENTS

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Cover Illustration: Sketches from the article on page 102 illustrating stages of housing development in Morocco.

TABLE OF CONTENTS

EDITORIAL		81
ABSTRACTS ON HOUSING, PLANNING AND CONSTRUCTION		
National Programs for Science and Technology in the Under-developed Areas (with illustration p. 85)	Jack Baranson	83
Second Generation of Computers: Smarter and More Sophisticated	Engineering News-Record	88
Short Glossary of Computer Terms	Engineering News-Record	91
International Definition and Measurement of Levels of Living	United Nations, Economic and Social Council, Statistical Commission	92
The Ten Year Development Programme For French Guiana	The Caribbean	97
Town and Country Planning in Ceylon (with illustration p. 101)	Government Town Planner, Ceylon	99
Morocco (with illustrations pp. 103, 104, 105)	Wolf Donner	102
House Plots in West Java, Part 2	Jaqueline Tyrwhitt	107
Residential Development in Outer Oslo (with illustration p. 111)	K. J. Jones	109
Experience with Expansive Clay in Peru (with illustration p. 113)	Forrest D. Clark	112
The Crisis in Community Development	Sushil Dey	114
The Dynamic City (with illustrations pp. 118, 119)	Department of City Planning University of Pennsylvania	117
Methods of Reducing the Cost of Public Housing (with illustrations pp. 121, 123)	School of Architecture, Pratt Institute	120

Population Data and Analyses Needed In Assessing Present and Future Housing Requirements	H. V. Muhsam	128
Preliminary Report of the United Nations Seminar on Evaluation and Utilization of Population Census Data in Latin America	United Nations, Economic and Social Council	131

APPENDIX

Recent Publications 135

EKISTICS is compiled by Mrs. Gwen Bell under the direction of Prof. J. Tyrwhitt.

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EDITORIAL

The theme which runs through the articles abstracted in this month's EKISTICS is the means of innovation, and then effects innovation in the development of settlements and nations. The article by Jack Baranson brings out many of the key points in summary. He points out the problems of innovation in traditional cultural and economic systems, but emphasizes that development and raising levels of living is based on innovation. His major premise is that the rate of technical development in the underdeveloped countries will depend mainly on their adaptive innovations, arising through education, exchange of ideas between countries, and fitting of known techniques to existing situations.

Perhaps one of the most dramatic areas of innovation today is in the development of automatic data processors: computers. These have become developed to the point of being able to be used as effective and practical tools in a variety of problems posed by development.

Like growth of any kind, it is desired to find a way to measure the rate of economic and national development in order to test the effectiveness of development programs and to indicate areas in need of stimulus. A United Nations report on a technique of measuring the level of living is abstracted. This gives in brief the pointers they have judged to be the best indicators among those that are capable of being measured.

INNOVATION IN TRADITIONAL CULTURAL AND ECONOMIC SYSTEMS

In most countries, a certain degree of innovation is expected to be stimulated by planning, either at a national, regional or city level. Reports of such programmes in French Guiana and Ceylon are abstracted. Wolf Donner summarizes the problems resulting from migration to the city and population growth. He evaluates the innovations in housing design which have been made to alleviate the problem and makes suggestions as to the direction of further innovations.

In some countries, adaptive innovation from other cultures and environments has worked out poorly. This is the case in the adaptation of the "garden city" idea to the suburbs of Oslo. And in Talara, Peru, the building of European style houses with their lawns instead of native housing proved tragic until modified to better fit with the environment.

In India community development has too often been connoted merely with technical innovations instead of its real purpose "to nourish the urge to grow within the human being".

INNOVATION THROUGH EDUCATION AND EXCHANGE OF IDEAS

Universities have traditionally been the places for a critical reevaluation of ideas and have often proved sources of new ideas. Two recent university sponsored studies are included in this issue: the first, a student project from the University of Pennsylvania; the second, an evaluation of comparative costs of different house types from Pratt Institute, New York.

They first found that by re-designing the city of Chandigarh in India, using some new premises, a far greater density could be attained with an improvement in social conditions. They produced some interesting designs of sunken two and three level "ceremonial places" (a plazas) and claim that the methods they adopted allow for continuous "dynamic" growth. It is interesting to compare this with the re-design of Stevenage, the first of the English New Towns, by students of the Architectural Association ten years ago (1950) for which many of the same claims were made. Both student projects (taking off from the shoulders of the official project) have undoubtedly included many pointers as to the direction new projects will follow.

The Pratt Institute study usefully brings together many well-known facts, but avoids conclusions.

The United Nations continually sponsors world-wide and regional seminars to exchange ideas between countries. At present, a series of seminars are being held on the use of census data. Two papers from these are abstracted: the conclusions from the first seminar held in Chile, November-December 1959, and a paper on the assessment of housing requirements from the second seminar held in Bombay, June-July 1960.

Baranson, Jack
NATIONAL PROGRAMS FOR SCIENCE AND TECHNOLOGY IN THE UNDERDEVELOPED AREAS
Bulletin of the Atomic Scientists, May 1960. Pages 151-154. Illustrations.
338.984 (100)

1. Mr. Baranson, a research associate with the Brookings Institution and formerly with the National Science Foundation, takes an imaginative approach to the problem of economic development. This contrasts with the kinds of programs which are currently being outlined as it is based on technological innovation.

2. This paper is based upon the premise that science and technology can exert a significant impact upon the scope and pace of economic growth in the underdeveloped areas. The crucial question is how an underdeveloped country, with limited educational levels and a dearth of technical skills, can begin to utilize the world pool of scientific knowledge and technological achievements. A core problem is recognizing where to break the pattern of economic stagnation with technological innovation.

3. Particular exception is taken to the premise that scientific and technological data are applicable everywhere on the face of the earth. There must rather be a process of adaptive innovation, wherein world science and technology are culled and adjusted to suit the very special needs and very limited means of developing economies.

4. The Role of Science and Technology in Economic Development. In raising an economy above subsistence levels, the problem is one of increasing the efficiency of satisfying human wants--in economizing on human effort by raising productivity. Science and technology constitute the frontier of new insights, leading to new ways to exploit resources and increase the abundance of goods. Together they serve as handmaiden to economic growth and development.

5. In economically underdeveloped countries, experiencing what has been most aptly termed a "revolution of rising expectations," the catalytic effect of science and technology upon economic growth may prove particularly significant. Unlike chemical catalytics, however, science and technology may profoundly alter the soci-economic "chemistry" in the process of ferment and change. Each country will have to find its own synthesis in applying a tactic and strategy of catalyzing growth.

6. Although there is widespread consensus on the significant role science and technology can play, opinions vary as to a philosophy of implementation. There are those who take the broad front, or scientific breakthrough approach, to develop new foods, new fuels, and new patterns of social and economic organization. Emphasis in this paper is upon the second approach of specifically seeking out areas of economic

stagnation and developing increments of innovation that will begin to induce productivity and economic growth. For example, if soil fertility is low in the agricultural sector of a particular economy, and extensive use of imported fertilizers is too costly--are the indigenous, nitrogen-rich, lake muds in the region usable substitutes, and can an economical process be found to dry the mud? Adapting innovation in fragments to suit local conditions tends to be a boot-strap operation, but it seems to be an inescapable choice.

7. Sources of Innovation (See Diagram 1.) The gap between understanding and application determines the scale of effort required to solve certain technological problems. Based upon this premise, the pursuit of the practical and immediate is an inexorable choice in underdeveloped economies for two major reasons:

(1) Typically, these countries have neither the capital resources nor human skills to pursue wide-gap research problems; and

(2) The practical and immediate are much more quickly contributive in a bootstrap effort to raise economic levels.

8. Scarcity in the funds, facilities and manpower to pursue innovation demand that the gap between the trial and error of experimentation and realized innovation be a narrow one. Certain scientific and technological problems have a very wide empirical gap, which may necessitate extensive utilization of manpower and funds. Such projects as desalinating water on a massive scale or converting algae into edible protein cannot afford to pre-empt innovational efforts in a single country. They may warrant a regional, cooperative effort, however.

9. Whatever the source of new technology may be--invention or adaptive innovation--the absorption and dissemination of scientific knowledge and of technological know-how are critical impact factors in economic growth. The rate of diffusion is a function of social and political organization and economic environment. Under a private enterprise system, profitability conditions the diffusion rate of innovation. In underdeveloped areas, the impetus of public initiative may be necessary to supplement private sector self-interest in introducing innovation.

10. Means of Inducing Innovation. (See Diagrams 2A and 2B.) The crux of this paper is to rationalize instruments and patterns for introducing science and technology as a catalyst of economic growth. Institutionally, the problem is twofold and includes both the absorption and feedback of innovation. On the one hand, there is the task of innovational intake, or pairing stagnant economic conditions with technological syntheses. And, secondly, there is the formidable problem of infusing innovation so as to induce economic growth.

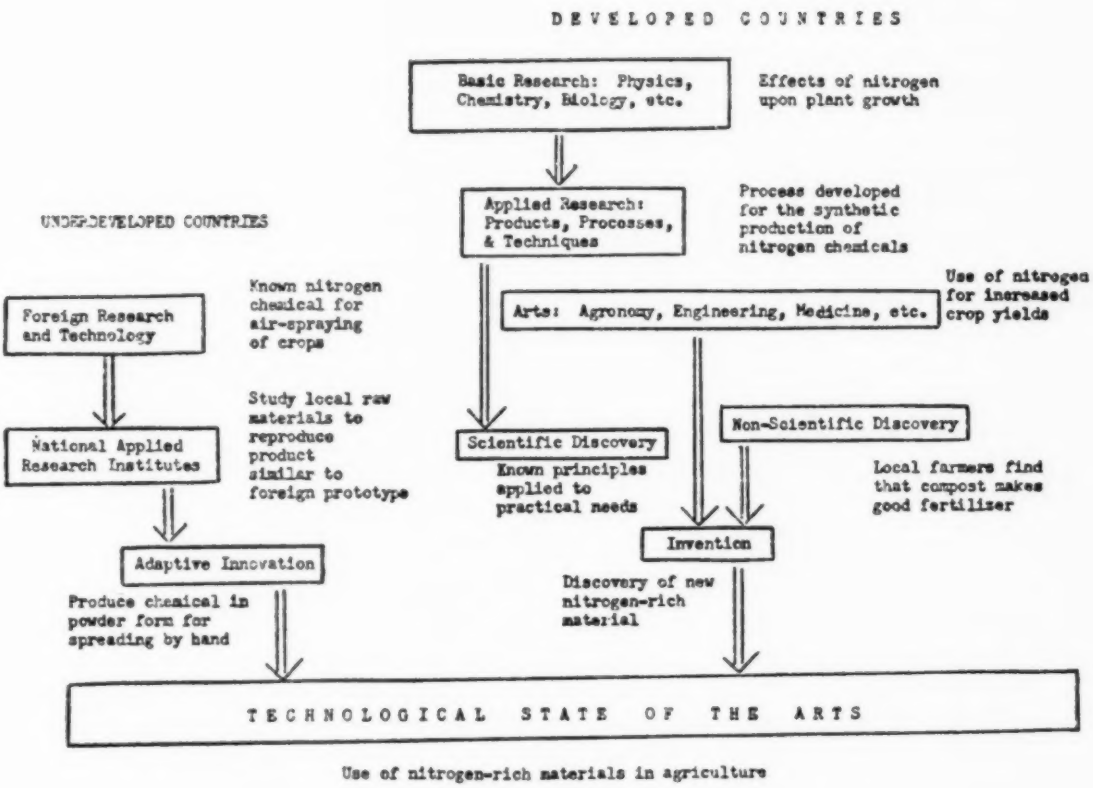

DEVELOPED COUNTRIES
Basic Research: Physics, Chemistry, Biology, etc.
Effects of nitrogen upon plant growth
Applied Research: Products, Processes, & Techniques
Process developed for the synthetic production of nitrogen chemicals
UNDERDEVELOPED COUNTRIES
Foreign Research and Technology
Known nitrogen chemical for air-spraying of crops
Arts: Agronomy, Engineering, Medicine, etc.
Use of nitrogen for increased crop yields
National Applied Research Institutes
Study local raw materials to reproduce product similar to foreign prototype
Scientific Discovery
Known principles applied to practical needs
Non-Scientific Discovery
Local farmers find that compost makes good fertilizer
Invention
Discovery of new nitrogen-rich material
Adaptive Innovation
Produce chemical in powder form for spreading by hand
TECHNOLOGICAL STATE OF THE ARTS
Use of nitrogen-rich materials in agriculture

DIAGRAM 1. The Sources of Innovation

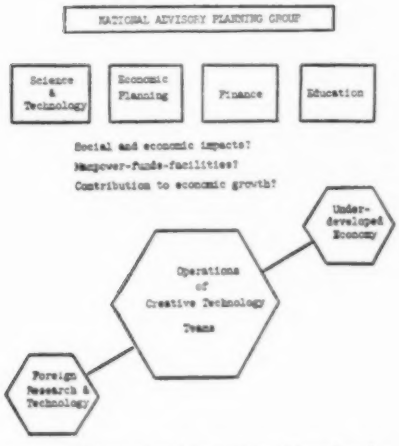


DIAGRAM 2A. Means of Inducing Innovation: Planning for Creative Technology Teams

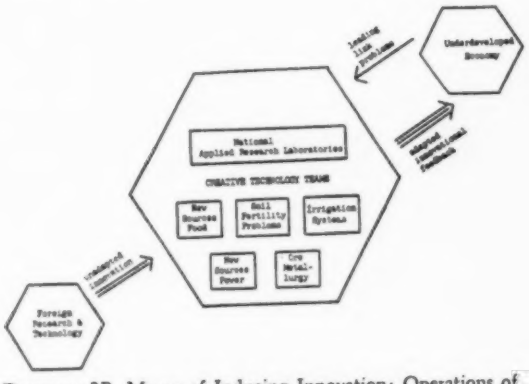


DIAGRAM 2B. Means of Inducing Innovation: Operations of Creative Technology Teams

11. There must be institutions to formulate problems and organizational instruments to find applicable solutions. Creative technology teams are proposed to fill this necessity. Their function would be to select the innovational ingredients of economic growth by direct field observation and then crystallize and formulate the technological problems to be solved. These technological innovators would then attempt to find processes and products adaptable to indigenous requirements and technical capabilities, and somehow feasible within the domestic social and economic environment. In pairing problems with solutions, these teams would work in direct co-ordination with the national research centers. A portion of their time would be spent abroad visiting laboratories and experimental stations, reviewing sources of technical information, and even attending trade fairs for new ideas on processes and techniques that could be adapted to their home country needs.

12. Economy of effort demands the assimilation of foreign innovation, for unlike technologically advanced countries, there do not exist within the national boundaries of an underdeveloped area a sufficient number of innovation-generating institutions. Innovational migration can be achieved by a three-way interchange among the socio-economic sectors of an underdeveloped area, the national applied research centers, and foreign innovational sources (see Diagram 2B). However, the science and technology of developed economies must be culled by eyes trained in the needs and limitations of their home countries.

13. Exchange media to abstract and translate foreign research journals constitute an essential support element for programs to infuse innovation. Education also has a major task in providing the technical skills. There will be the need for innovators with creative minds, leavened by practical association with industry and government. Human resources will be a scarce commodity, yet they are the keystone to programs in scientific innovation. Certain levels of domestic primary education are indispensable; most advanced training for critical categories of technicians and cadres of adaptive innovators may initially have to come from abroad. Perhaps the most vital ingredient in education is to impart a philosophy and an outlook that are socially contributive, yet motivated by self-interest.

14. Once a national program has been planned, foreign assistance in terms of critical skills and capital funds may be most effectively applied. Institutes for applied research will need certain equipment and technical assistance. Each creative technology team could initially include a foreign consultant, and certain supplemental financing of tours abroad may be necessary. Abstracting and translation services constitute other activities that will require counterpart financing and technical assistance. Direct loans could be made to specific innovational projects under private or public sponsorship. A critical aspect involves the self-interest of human nature. There must be built into each program the rationale for individuals to repatriate themselves with the know-how they have absorbed abroad.

15. National Programs for Science and Technology. In formulating a national approach to science and technology, a coordinated and compatible effort must be worked out, taking into consideration economic planning, fiscal policy, and the level of education. From the operational standpoint, this paper has presented four leading links in the initial phases of national programs:

First, there is the organization of creative technology teams. In national programs, these teams serve the function of crystallizing technological needs in the economy and setting in motion the contributive flow of innovation.

Secondly, these teams should preferably work under the direction of applied research institutes, which would address themselves to the most immediate problems of raising productivity in agriculture and industry. Typical projects might include the development of a bullock-powered irrigational pump or a process to extract methane gas from organic farm waste.

Thirdly, the flow of technical and scientific information serves as a significant vehicle in stimulating the innovational process. National programs should encompass the importation of information oriented to problematic needs and provide for the domestic dissemination to innovational consumers.

And fourthly, educational programs in support of innovational change constitute a vital element in over-all plans. They serve both the manpower resources required for innovators and provide the technicians and engineers to serve an expanding technology.

Engineering News-Record
SECOND GENERATION OF COMPUTERS: SMARTER AND MORE SOPHISTICATED
Engineering News-Record, April 14, 1960. Pages 40-42. Illustrations.
31: 621.38: 651.2 (100)

1. With the growing sophistication of planning and building techniques, data processing by means of computers is becoming a practicable tool. Computers, themselves, are changing, becoming faster, more efficient, and cheaper for use. EKISTICS published articles on how data processing has been used in planning in September 1959. This article now presents some facts about computers and a glossary of terms.

2. The second generation of electronic digital computers is here. It hasn't yet outmoded the first generation; but the implication of their work is clear:

a. The new computers are more rugged.
b. Transistors are used instead of vacuum tubes.
c. Methods of getting information into and out of machines have been improved.
d. Programming can be simplified.

3. The basic principles of construction and operation of all computers are about the same. In essence, a computer is a high-speed adding or subtracting machine. If not designed for subtraction, it subtracts by adding a complement of a number; if not designed for addition, it adds by subtracting complements. It multiplies by repeated addition, and shifting of decimal places, divides similarly by repeated subtraction. For more complicated operations, such as extraction of roots, differentiation, integration, and trigonometric, logarithmic and exponential functions, it usually employs a method of converging approximations.

4. An operation can be completed in a few thousandths or millionths of a second, depending on the design. Electronic circuitry makes this high speed possible. All operations are based fundamentally on a binary system--either something is present or it is not, either there is or there isn't a hole in a punched card or paper tape, or a magnetic spot on tape or memory drum, or a current flowing through a circuit. Symbolically, these conditions are represented by 1 and 0 respectively.

5. A distinguishing characteristic of electronic computers is their ability to carry out long sequences of arithmetic operations automatically. They memorize their instructions as well as the data to be operated on, then carry out the instructions step by step on signal. Furthermore, they can decide between alternatives or modify the instructions.

6. Remarkable as the devices are, they still are only robots. They do only what they are told to do within their capacity. So they must be given detailed, accurate

instructions, or programs, for each problem and development of such programs often takes many man-hours. Once a program has been developed for a specific type of problem, it can be used repeatedly, different numbers being used for the variables each time. Earth-work-computation programs, for example, are extensively employed in civil engineering offices; they are used over and over again on different sets of field notes. A program for calculating earthwork quantities is stored in a computer's memory; then the field data are fed into the device; the machine is ordered to compute, and finally the required quantities are tabulated by the output equipment. The program, on tape or cards, then is filed for future use on new data.

7. Computers made by different manufacturers differ in electronic circuitry and components. But usually the general-purpose, stored-program type consists of five basic sections: (1) input, (2) memory, (3) arithmetic, (4) control and (5) output.

8. Input equipment feeds data and instructions into the memory. The information may be fed directly from an electric typewriter or recorded in advance on punched cards, punched paper tape or magnetic tape. Equipment is available that automatically converts decimal digits and letters into binary code for "reading" information into the memory.

9. Information for a computer is organized into groups, called words. The word length can be specified for some machines by the programmer; for others, it is fixed by the manufacturer. The fundamental unit composing a word is a bit--a 1 or an 0. These bits are combined in accordance with a machine's code to form digits. So, in effect, words also are composed of a specific number of digits. These digits, in accordance with another machine code, give instructions to the machine, supply it with a number with a plus or minus sign to be stored or operated on, and tell it where to store or look for a number. But actually computer works on "bits."

10. Internally, the machine reads the bits from punched cards or tape with metallic brushes or photoelectric cells and from magnetic tape with electro-magnetic heads. Whenever a hole or magnetic spot appears under the reading device, a pulse of electric current flows into the memory. So the presence or absence of current signifies a bit. The portion of a word to be stored is ent, as bits, to a specific location in the memory. Each location has a number, or address, assigned to it for identification. The computer can be told to put a set of digits in a certain address or to take one out from there. The time it takes a computer to obey this command is called access time.

11. The fastest commercial memory device now in use is the magnetic core matrix, which has an access time of a few millionths of a second. It consists of ferr-magnetic toroids (doughnut shapes) about .08 inches in diameter strung on criss-crossing and

diagonal wires. A current through a pair of criss-crossing wires magnetizes the core at their intersection; thus a magnetized or unmagnetized core represents a bit. The diagonal wires are used to "read" the cores.

12. The widely used magnetic drum is a medium-access storage unit. It has an access time of a few thousandths of a second. A nonmagnetic metal cylinder coated with a magnetic material, the drum records bits as the presence or basence of magnetic spots in parallel bands on its surface. It rotates at high speed while electromagnetic "read-write" heads around the periphery of each band add, remove or record the presence of magnetic spots. Sometimes rotating disks are used for storage.

13. Magnetic tape also may be used for storage, but it is relatively slow for this purpose. However, it can store large amounts of information compactly at relatively low cost. It is particularly useful as an auxiliary memory with lower capacity, faster-access devices. Tape can be filed and re-used when needed.

14. When instructed to do so, a computer shifts numbers, as bits, from memory through an arithmetic unit, where numbers are added, subtracted, multiplied and divided as required by the program. Since this is done by electronic circuits, several hundred operations can be performed in a second. In comparing numbers, the arithmetic unit also can make "yes" or "no" decisions. On instruction, the computer shifts results to the output or to assigned addresses in the memory.

15. Finally, the machine writes out the answers. For fast output, results may be recorded on magnetic tape. Or punched cards or tape may be used. Sometimes, the results are fed directly to an electric typewriter.

16. In short, then, the latest computers are designed for fast and easy input of data and instructions. The instructions may be in a code based on ordinary English and mathematical terms. The machine stores information in medium or fast-access memories, sometimes supplemented by large-capacity slower-access memories. Their control unit causes operations to proceed automatically in the sequence dictated by a stored program. And the results are typed or printed out at high speed.

Engineering News-Record

SHORT GLOSSARY OF COMPUTER TERMS

Engineering News-Record, April 14, 1960. Page 41.
001.4: 651.2 (100)

1. Access time - Interval during which a word is put into or taken from storage.

2. Address - Set of numbers identifying the cell in the memory where a word is to be stored or found.

3. Bit - Representation of a binary digit.

4. Collator - A machine for comparing punched cards and sorting out those with specified information.

5. Computer, digital - A device that executes sequences of internally stored instruction, calling for arithmetic and logical operations on numbers.

6. Core, magnetic - Wired device capable of being magnetized and demagnetized, used in the memory for storage of a binary digit.

7. Drum, magnetic - Rotating cylinder with magnetic coating, used for storage of binary digits.

8. Flow chart - Graphical representation of a sequence of arithmetic and logical operations.

9. Memory (storage) - Device for receiving, storing and supplying information and instructions.

10. Microsecond - One-millionth of a second.

11. Millisecond - One-thousandths of a second.

12. Plugboard - Removable panel, usually prewired, with electronic circuits for execution of a specific program.

13. Program - Detailed instructions for a computer to perform desired computations.

14. Routine - Portion of a program giving instructions for attaining a minor objective.

15. Word - Group of characters representing instructions and information, handled by a computer as a basic unit.

United Nations, Economic and Social Council, Statistical Commission
INTERNATIONAL DEFINITION AND MEASUREMENT OF LEVELS OF LIVING
Progress report by the Secretary-General. March 9, 1960. Mimeographed Paper. 32 pages.
36 (100)

1. In the July 1959 issue of EKISTICS an abstract was used of the "Report on a Coordinated Policy Regarding Family Levels of Living" from the United Nations Department of Social Affairs. Then in the February EKISTICS of this year, a paper given at the U.N. Seminar on Utilization of Census Data held in Latin America, by Bernard Benjamin was abstracted. As this subject continues to be refined to be of greater use in the practice of ekistics, pertinent articles will be continued to be abstracted. This one presents the official progress report on the subject to the Secretary-General of the United Nations.

2. Components, Indicators, and Basic Information for the Measurement of Levels of Living. The inter-agency Working Party on Statistics for Social Programmes which met in Geneva in September 1959 adopted as a basis for its discussion of components and indicators the following:

a. Health
b. Food consumption and nutrition
c. Education
d. Conditions of work and employment
e. Housing
f. Social security
g. Clothing
h. Recreation
i. Human freedoms

3. It is recommended that those items that are closely related to levels of living in the same sense as the above components, should be considered:

a. Population and labour force
b. Income and expenditure
c. Communications and transportion

(1) Mass communications
(2) Post and telecommunications
(3) Transportation

4. Health. The following priority indicators are recommended under this component:

a. Expectation of life at birth
b. Infant mortality rate
c. Crude annual death rate

Expectation of life at birth is considered theoretically the best indicator of levels of health. The infant mortality rate has traditionally been regarded as one of the best measurements of environmental sanitation closely correlated with the general levels of economic and social development.

5. Food Consumption and Nutrition. The following indicators are recommended under this component:

a. National average food supplies in terms of calories at the "retail" level compared with estimated calorie requirements;
b. National average food supplies in terms of total proteins at the retail level;
c. National average food supplies in terms of animal protein at the retail level;
d. Per cent of total calories derived from cereals, roots, tubers and sugars.

6. The first indicator relates purely to the quantitative aspects of the diet. It is noted that no satisfactory and practicable indicators of actual nutritional status of people have yet been developed, although the second and third indicators have a bearing on it, since they may be regarded as partial indicators of the nutritional quality of the diet. The fourth indicator is indirect: with the two previous indicators it gives a negative correlation of nutritive value.

7. Education. The following priority indicators are recommended:

a. "Adult literacy rate" - percentage of population 15 years and over able to read and write;
b. "Total school enrolment ratio" including the following:

(1) "primary school enrolment ratio"
(2) "higher education enrolment ratio" - total enrolment in institutions of higher education per 100,000 population.

8. There is also agreement on the usefulness of the following supplementary indicators of education:

a. "Index of educational attainment" - median number of years of formal schooling completed by population 25 years and over;
b. "Pupil teacher ratio" - average number of pupils per teacher in all primary schools, urban and rural.

9. Employment and conditions of work. The following priority indicators are recommended:

a. Proportion of persons unemployed in the total labour force;
b. Ratio of male labour force in agriculture to total male labour force;
c. Relative real wages (including wage fringe benefits) in selected occupations.

10. The proportion of persons unemployed in the total labour force is recognized as a significant indicator under this component in countries where comprehensive statistics are available, or where fairly reliable estimates can be made. In the less developed areas underemployment is frequently of greater economic and social significance than complete unemployment. It is considered premature to recommend any indicator for international use for underemployment, although progress is being made in refining it.

11. Housing. The following priority indicators are recommended:

a. Per cent of the population living in "dwellings"
b. Per cent of occupied dwellings with three or more persons per room (overcrowding)
c. Per cent of occupied dwellings with piped water.

A "dwelling" is defined for the purpose of a housing census in terms of a permanent building as distinct from semi-permenent rustic housing units such as huts and cabins, and mobile and improvised housing units.

12. In addition to these priority indicators, the following are recommended:

a. Per cent of the population living in substandard housing units
b. Average number of persons per room, for occupied dwellings only
c. Per cent of occupied dwellings with flush toilet (urban)
d. Index of change in number of dwellings in relation to population growth.

13. Social Security. The importance of this component is recognized and considerable progress has been made in systematizing social security statistics. However, differences in the organization of social security schemes in various countries make it

extremely difficult to determine the extent of social security coverage and the number of participants and beneficiaries on a uniform international basis.

14. Clothing. This component has been retained, even though it is not considered possible to recommend indicators for purposes of international comparison, since the adequacy of clothing is significantly affected by climate, occupation, and cultural factors.

15. Recreation and Entertainment. The difficulty of measurement in the case of this component is due to the differences that prevail in forms of recreation and entertainment and the virtual impossibility of getting internationally comparable data on the older and more traditional forms including that element that arises from family and personal relationships. Indicators of the more modern forms, such as the number of cinema seats, theatre seats, museum visits, etc., per 100,000 population can be used, but they give an inadequate and misleading picture of the level of this component in many parts of the world.

16. Human Freedoms. The Working Party noted that there has been considerable agreement on the importance of this component, but doubt how it could be measured in quantitative terms and could not recommend specific indicators.

17. Population and Labour Force. With the exception of mortality figures included under the health component, data on demographic structure are not considered to be international measures of the levels of living. It is, however, suggested that data on population growth, the age structure of the population and the urban-rural distribution are so closely related both as cause and effect with levels of living that data on the demographic situation should be included as basic background information.

18. Although it is realized that, particularly in the less-developed countries, labour force data are an important factor in the economic and social development, it is proposed that these data should be included as basic background information rather than direct indicators. It is suggested that the following items be included here:

a. Proportion of total population in the labour force;
b. Proportion of persons under fifteen in the labour force;
c. Proportion of persons sixty-five years of age and over in the labour force;
d. Percentage distribution of labour force by status, i.e., employees, employers and workers on own account, family workers, and members of producers' co-operatives;
e. Percentage distribution of labour force by principal industrial categories;
f. Percentage distribution of labour force by principal occupational categories.

19. Income and Expenditure. The items proposed within this category fall into two groups, the first reflecting the over-all trends and the second including data on government and private expenditure in the different social fields. The following items are within the first:

a. National income per capita and annual rate of growth
b. Private consumption expenditure per capita and average annual rate of growth.

20. The Working Party considered it important in connexion with the study of levels of living to evaluate the government and private expenditure for education, housing and other aspects of social development, and therefore considered the following in the second group:

a. General government consumption expenditure - percentage devoted to education, housing and other social services;
b. Private consumption expenditure - percentages devoted to health, food, education and rent;
c. Private household expenditure distributed by object of expenditure.

21. Communications and Transportation. Transportation and communication are a vital factor not only because of the influence they exert on the nature and extent of the utilization of the country's resources, but also because of the extent to which they facilitate individual mobility and enable a more thorough utilization of social services affecting the various other components in the levels of living. The following broad categories of basic information should be considered:

a. Mass communication

(1) Average circulation of daily and non-daily newspapers per 1,000 population
(2) Number of radio receiving sets in use per 1,000 population.

b. Post and telecommunications--number of telephones per 1,000 population

c. Transportation

(1) Number of power-drive road vehicles per 100,000 population
(2) Kilometres of roads, separately for metalled and non-metalled roads, per sq. km. of area
(3) Kilometres of railways per 100 sq. km. of area.

The Caribbean

THE TEN YEAR DEVELOPMENT PROGRAMME FOR FRENCH GUIANA

The Caribbean, March 1960. Pages 42-44. Illustration.

338.984: 71 (882)

1. With the awareness of the necessity for development, throughout the world, EKISTICS has abstracted articles on the techniques of programming (June 1960) and this month abstracts from a development programme. Drawing up a Ten Year Economic Development Programme was the first assignment of the Economic Development Committee of French Guiana, established in March 1959. The Programme, intended for both Government and private enterprise, deals with those potentialities of the country that can be successfully exploited; action required to trigger off economic expansion; and the broad outlines of general development.

2. In the first section, a full description of the potentialities of French Guiana and of present conditions is given. The conclusions are that the economy of French Guiana is an artificial one, since it is mainly subsidized, and that it is essential, from 1960 and for the next ten years, to effect a radical change in the structure of this economy. Indeed, the economy will develop only if it is based on the known natural resources such as agriculture, animal husbandry, forestry, mining and fishing and if French companies take advantage of the geographical location of French Guiana to market their products in South America.

3. In keeping with the necessity of reshaping the local economy on a new basis, the second section of the report lists the following general aims and objectives which the different branches of industry should set themselves.

(a) proceed from the "assessment" stage to the "production" stage;
(b) determine the most promising fields for the development of new undertakings;
(c) promote immigration from the West Indies by making heavy capital expenditure;
(d) assist the "Franc Area" to cut down on foreign currency expenditure and attract foreign capital;
(e) promote progressive substitution of private and foreign capital for Government spending.

4. In the field of agriculture, top priority should be given to the cultivation of food crops likely to grow well locally. This will have the favourable effect of improving the balance of trade. Next, every effort must be made to promote the growing of export crops with a sound market such as cacao, coffee and rice. This must be followed by an active marketing programme to encourage the sale of products on the domestic and foreign markets.

5. Since French Guiana is heavily dependent on foreign imports for its supply of meat and dairy products, cattle rearing in the highlands should be increased from the present figure of 2,500 head to 5,000, whilst 10,000 animals should be reared in the lowlands. Farming of small stock and dairying should also be improved.

6. In the field of forestry, it is planned to increase annual production to 12 or 15 thousand cubic metres of lumber as early as possible by putting present facilities in working order or modernising existing plant. With the installation of additional machinery and improvement of milling methods, it is hoped to reduce production costs. All these developments should lead to adequate and up-to-date plant, with a yearly production capacity of 40,000 cubic metres of lumber. Concurrently, subsidiary industries based on sawmill waste or timber (as plywood) should be established as fast as the facilities are put in order. There are plans also to establish a paper pulp industry, using miscellaneous hardwoods as raw material.

7. The objectives of the mining industry are to exploit the KAW bauxite deposits, maintain gold at a production level of 500 or 1000 kilos and select for development, on the basis of promising research results, at least one new mineral besides the known ones of gold and bauxite.

8. The fishing industry should improve present gear and methods to appoint where local demand will be satisfied fully; encourage the establishment of a deep-sea fishing fleet; catch shrimps, which have recently been located off the coast; promote the export of high quality fish and supply a fish-meal factory with fish of non commercial value.

9. In the third section, there follows a discussion of the measures to be taken both by Government and by private enterprise to promote the results hoped for. The Committee emphasized that certain general steps must be taken without delay if the programme is to be implemented at all. These provisions more especially concern income tax, plant and information. In the opinion of the Committee, preferential tax legislation aimed at attracting private capital should be passed specifically for French Guiana, important road-and-harbour-works should be carried out and, last but not least, the potentialities of French Guiana should be actively publicized.

Government Town Planner, Ceylon
TOWN AND COUNTRY PLANNING IN CEYLON
EAROPH news and notes, January 1960. Pages 4-6. Illustrations.
711 (540)

1. The town and country planning activities in Ceylon proceed under the broad supervision of the Central Planning Commission constituted under the Town and Country Planning Ordinance, No. 13 of 1946. Of the schemes presently under consideration of the Central Planning Commission may be mentioned the Kataragama Planning Scheme, Kelaniya Planning Scheme, Mahiyangana Planning Scheme, Location of industrial areas in the Colombo region, Chalmers Granaries, Devinuwara Planning Scheme, Beira Lake site development (Colombo), and standards for parking lots and petrol filling stations.

2. Development by Government Departments. Government Departments continue to work without any regard to the local authorities concerned. With the expansion of many Government Departments, extensive building development has been carried out within and outside Colombo without reference to the pattern of town development, circulation of traffic, supply of such public utility services as water, electricity and drainage, shopping needs, housing, educational facilities, employment, location of industries, etc. This indiscriminate development in towns raises serious problems for the authorities. It is therefore felt that though Government Departments are exempt from the provisions of the Town and Country Planning Ordinance, they should set an example by conforming to it, and that some arrangement must be arrived at whereby Government Departments are obliged to consult local authorities to ensure that their plans fit in with planning schemes of local authorities.

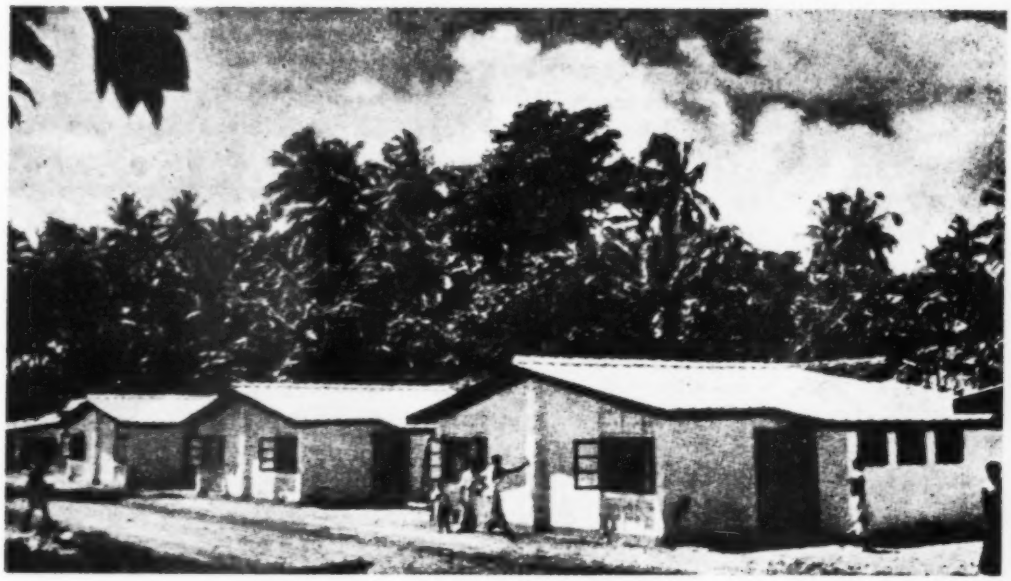
3. Technical Staff in Local Authority Areas. With an increasing number of planning schemes coming into operation, the lack of technical staff is acutely felt. This is reflected in the large number of appeals and inquiries from members of the public against building applications approved contrary to planning legislation. In the majority of cases the appeals were the result of wrong decisions made by the local authority through the lack of proper technical knowledge. In some cases the work of technical officers has been entrusted to non-technical officers on the Council's staff. There is now an urgent necessity for every Municipal, Urban and Town Council to set up a Planning Branch not only to prepare planning schemes and implement them, but also to advise members of the public on the limitations imposed on development by planning legislation before detailed plans are prepared for submission with the building application.

4. Slum Clearance Schemes. The Government continued to give local authorities monetary grants and technical assistance to help in solving the problem of housing and slum clearance. In the year 1958 grants aggregating Rs. 1,938,000 (approx. $407,000)

were allocated to 29 Urban Councils and 27 Village Committees for housing schemes. In these several new low-cost type houses designed by the Department were adopted. Each house was estimated to cost Rs. 3,500 (approx. $735) in the case of Urban Council's Schemes and Rs. 3,000 (approx. $630) in the case of others. The accommodation provided consists of two bedrooms, a verandah, living room, cooking place, and a lavatory. In areas where pipe-born water supply was available, water service facilities were included. Two important conditions of the grants were that the local authorities should maintain the schemes in a satisfactory condition and also prevent the erection of unauthorised shanties within their administrative limits.

5. Housing Scheme for Shanty Dwellers. Plans were prepared for 3 housing schemes at Maharagama, Kandy and Dehiwala for the accommodation of 330 families living in Shanty dwellings in and around Colombo and Kandy. The house type adopted in these schemes, which is the cheapest so far designed, are similar to those previously erected for shanty dwellers in Ceylon. Each house consists of two living rooms, a cooking place, bath and lavatory and costs only Rs. 1,250 (approx. $262). These schemes are provided with amenities such as playgrounds, community centre halls, bathing places, etc.

Housing Scheme for Shanty Dwellers at BORALESGAMUWA, Ceylon



Housing Scheme at ALUTGAMA, Ceylon

Donner, Wolf
MOROCCO
"Marokko Ein junger Staat und seine Wohnprobleme," neue heimat, March 1960.
Pages 30-50. Illustrations.
711.16 (64)

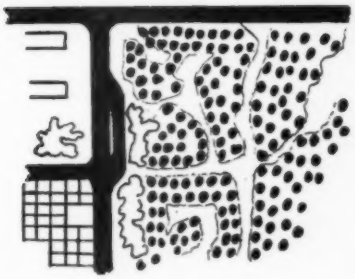
1. Wolf Donner points out in both words and illustrations the problems which have come to Morocco with its rapid change from a traditional culture to a modern industrial one. He inter-relates the cultural problems of the people with the physical problem of the planning and building of settlements for a society in transition.

2. Anyone driving through Morocco today will see towns which are in a state of becoming modern centers of industry or administration. With this comes the "bidonville"--stretches of houses built from any available material on any available land. They are similar to the squatter settlements in Johannesburg or Calcutta and are the expression of a certain historical and economic development. The administration of Morocco recognized the problems of this situation too late.

3. The problem of settling the Moroccans in acceptable housing is not alone a question of finance, it also depends upon the way of life of the people. One can see dwellings standing idle since completion while those they were built for continue to live in tents and huts. They refuse to move because the new style of living has no meaning for them.

4. To understand the architectural problem of Islamic housing one must understand the need for a patio which cannot be looked in on from outside. Whereever one goes in Morocco it becomes apparent that houses built in the traditional style have almost no windows. Street and alleys consist of walls, white or colored, broken by doors. Behind these doors is a patio which has flowers, trees, fountains, etc. The patio is enclosed by the "living rooms" which are on the first, or first and second, floors. The second floor has a gallery which runs around the patio. All windows in the rooms face the patio. Even today this style is still very popular with the Moroccans. Architects who build differently cannot expect people to move into their buildings--the undisturbed shut-off-ness is desired. Even today the house and the family are sacred, i.e., not for strangers' eyes.

5. Similar style dwellings can be discerned in the bidonvilles. Here also one winds through narrow alleys with walls only broken by doors. Even in these hovels, one enters into a patio. Even in poorness the people refuse to give up their style of living. The French city builders have carried this out in their designs. They developed an 8 x 8 meter (24 square foot) cell with patio, which can be repeated throughout the living quarters.

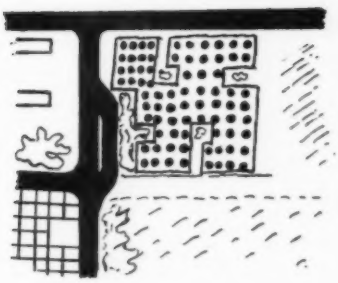


1

1 „Bidonville" im Naturzustand. Auf einem freien Platz zwischen zwei Straßen haben sich Zugewanderte Hütten erbaut.

"Bidonville" in the natural constitution. Newcomers have taken advantage of a free site between two streets to build some huts.

«Bidonville» à l'état naturel. Les nouveau-venus ont pris avantage d'une place libre entre deux rues pour construire des baraques.

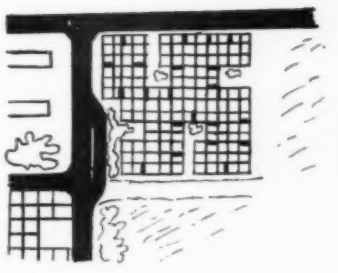


2

2 Verbessertes Bidonville. Die Behörden beschränken die Bewohnerzahl, teilen jeder Hütte einen Platz zu und versorgen die Bewohner mit Wasser, sanitären Einrichtungen und einer Schule.

Improved "Bidonville". The authorities limit the number of inhabitants, allot each hut a site and provide the inhabitants with water, sanitary installations and a school.

«Bidonville» perfectionné. Les autorités limitent le nombre d'habitants, assignent une place à chaque baraque et pourvoient les habitants d'eau, d'installations sanitaires et d'une école.

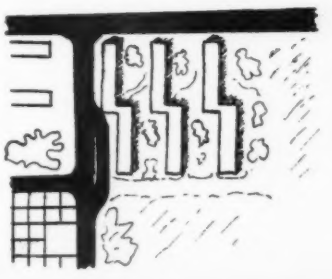


3

3 Parterre-Siedlung. An die Stelle der Hütten tritt eine massiv erbaute Siedlung aus 8×8-m-Wohneinheiten.

Ground-level housing estate. A well-built housing estate with dwelling units 27' by 27', takes the place of the huts.

Une colonie d'habitation au ras du sol. Une colonie d'habitation, composée d'unités de logement de 8 mètres sur 8 mètres, se substitue aux baraques.



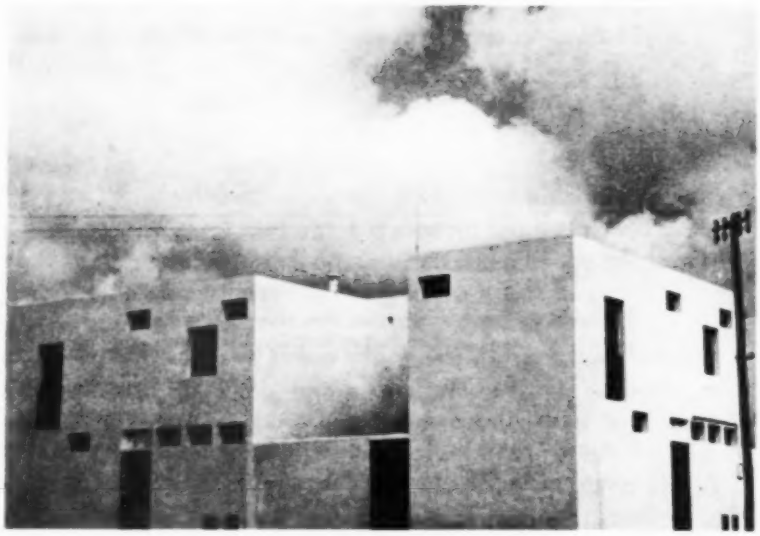
4

4 Wohnblock-Siedlung. Mit fortschreitender Änderung des Wohngeschmacks treten an die Stelle der Wohnzellen mehrstöckige Wohnhäuser. Die so gewonnenen Zwischenräume werden Grünanlagen.

Housing estate with blocks of flats. Following the continuous change in constructional taste, multi-storey houses take the place of the dwelling cells. The interspaces, thus gained, are converted into greens.

Colonie d'habitation avec des blocs de logements. Avec le changement continu du goût constructionnel, des maisons à plusieurs étages ont remplacé les cellules d'habitation. Les intervalles, ainsi gagnés, font l'objet d'une conversion en sites de verdure.

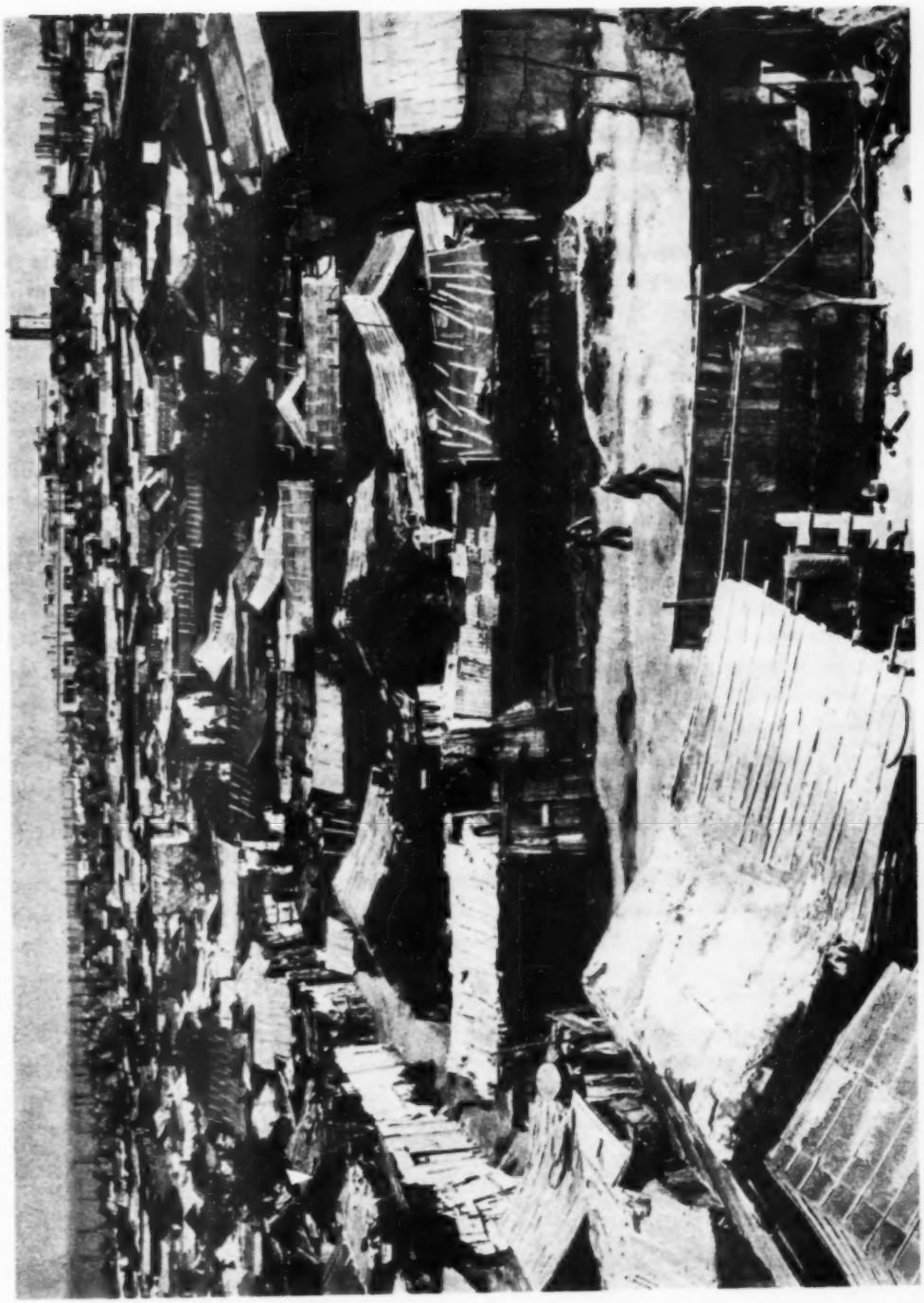
This type, found among other places in Salé (Rabat Province), is one of the most interesting house constructions. In consideration of the desire to preserve the interior yard for each flat, a solution has been found here to build, nevertheless, two storeys high and also to guarantee a patio to the upper storey. However, the construction had to be arranged in such a way as to prevent anybody from looking into the lower patio.



Casablanca, modernes Eingeborenenviertel Ain Chock, gebaut 1944, Teilansicht. Das Viertel enthält öffentliche WCs, Brunnen, Waschhäuser, Kanalisation, Kindergärten, Schulen und Moscheen sowie Wohnungen aus zwei bis drei Räumen von insgesamt 8×8 m mit Innenhof, Küche und WC.

Casablanca, modern native quarter Ain Chock, built in 1944, partial view. This quarter has public conveniences, wells, wash-houses, a sewerage system, kindergartens, schools and mosques as well as dwellings consisting of two or three rooms with a total of 27'×27' with an interior yard, kitchen and WC.

Casablanca, quartier indigène moderne Ain Chock, construit en 1944, vue partielle. Ce quartier possède des W.C. publics, des fontaines, des lavoirs, un système de canalisation, des jardins d'enfants, des écoles et des mosquées ainsi que des logements de deux à trois pièces d'un total de 8 mètres sur 8 mètres avec une cour intérieure, une cuisine et un W.C.



6. Government Planning. The efforts of the government are in two directions:

(1) To resettle the people who live in the bidonvilles.
(2) To resettle the rural people.

7. The building of the new Medina of Casablanca to discourage overcrowding was begun in the 20s. A section of town was built with all conveniences, but this section was soon crowded. After the Second World War it served as a substitute for the ever-increasing bidonvilles at the gates of the city. At this time, the 8 x 8 meter dwellings were built for the people. However, the floor plan of these "living cells" was their downfall. Soon it was learned that even cheap housing can become expensive when not well planned. From this awareness grew the idea of neighborhood groups which would be built of the existing dwellings. The group would include all the needed conveniences for 9000 people centered around a shopping center. This center would be an open place for meeting as well as shopping. It appears that the problem cannot be completely met without building in height. The current plan is to first make the bidonvilles liveable by the provision of facilities and re-planning, then to replace them with apartment blocks.

8. In resettling people from the country, there has been plans for the building of small centers for industry. In the course of a five-year program it is hoped to build 50 village centers which would employ people now scattered in rural areas. Thus with the spreading of industrialization throughout the whole land, the older cities will be relieved of the heavy migration and the whole country's standards will rise.

Tyrwhitt, Jacqueline
HOUSE PLOTS IN WEST JAVA, PART 2.
711.6 (91)

1. The May issue of EKISTICS contained a short article entitled "Preliminary Research into Uses of House Plots by New Regional Planning School in Indonesia." This article analyzed some data collected in two distinct "desa" (village-towns) and drew some tentative conclusions, which appeared quite valid.

2. The study is a good example of misleading results from partial knowledge of a situation. The exercise was based on the assumption that it would be possible to define "house plots." Further knowledge of the Indonesian law of custom "adat" showed that the concept of "house plot," with its concomitant concept of "land ownership," simply does not exist in Indonesian rural society. Individual ownership extends only to the things placed or grown upon the land by a house occupier: the vegetables but not the vegetable plot, except in so far as the man customarily uses that particular piece of ground for this purpose.

3. This approach invalidates, not the facts of the May study, but the possibility of arriving at a rational plot size for each individual house.

4. It seems, however, that it may be perfectly possible and practicable to arrive at standard plot sizes for small groupings of houses. As far as we can tell at present this would be for an average of four houses, though actual grouping of three and five would be more common (thus allowing for variation in spatial needs). This repeating element would contain one well, one washing place, one fish pond, a small banana grove and a drying area (an area of beaten earth used for drying agricultural produce, particularly rice, as well as clothes lines, and also available for children's play). Each house would require individual space for cooking, wood storage (fuel), and vegetable plot, shade trees and animal sheds might or might not be grouped, but space would have to be allowed for them in the standard unit.

5. No attempt has yet been made to determine the standard area of this unit but only to define the functions that have to be performed upon it. As our surveys have shown that groupings of three and five dwellings seem to be more common than four, the unit should probably be large enough to accommodate five minimum dwellings.

6. In practice, the general intention would be to layout the standard units, provide the permanent social equipment--well, wash place and fish pond, and access path or road--and leave the construction of the houses, etc., to the people themselves under the general supervision of their own leaders. In Indonesia, based as it is upon rice

culture, cooperative work is a well-understood custom, usually extending over a considerably larger group than the three to five families which would comprise the basic standard plot unit.

7. Naturally the division of an area of land into a tight grouping of standard plots, with adequate access to each, would not provide for the essential needs of the small community. Space would have to be left in Indonesia for a small "warung" or house-shop, for a small "langgar" or chapel and a communal clump of bamboos, from which material for house repairs can be cut. This space serves the same purpose, as stated in the May article, as the Doxiadis gossip squares and children's playgrounds for his Communities Class II. In Indonesia the house-shop is a necessity, as well as a social center. Rice cultivation requires the work of all men and women several times a year and "eating out" is a custom indulged in even by the very poor. Indonesia is also a Moslem country and frequent modest prayer places (near a source of water) are needed, though often these may appear as very simple huts.

Jones, K. J.

RESIDENTIAL DEVELOPMENT IN OUTER OSLO

Journal of the Town Planning Institute, May 1960, Pages 138-142. Illustrations
333.327:711.58 (481)

1. With the expansion of cities and the ease of transportation, the outskirts of most older cities throughout the world are being developed mainly for housing. This takes various forms: new towns, indiscriminate sprawl, and various mixtures between these two poles. The most notable feature of Oslo's post-war development has been the building of the 'suburb towns' (forstadsbyer) on the city's outskirts. Though Oslo suffered little destruction, the War bequeathed an acute housing shortage, and until recent years planning and development have been almost entirely concerned with satisfying this demand. Thirty-four thousand dwelling units (two-thirds of Oslo's post-war housing) have been built in these 'towns.' In particular two extensive districts in the east and south have been planned to provide homes for 50,000 and 90,000 persons respectively.

2. Further low density development of the pre-war nature is considered undesirable in view of the increasing distance of residential areas from the centre, the cost of providing utilities and communications, etc., and the social disadvantages of 'dormitory' suburban development. Instead, it is preferred to expand the city in the form of 'suburb towns,' comprehensive, relatively compact units (linked with the centre by suburban railways), which should be economically, socially and physically part of Oslo but self-sufficient to a certain degree. The local shopping centres, for example, though selling much more than the daily or weekly needs of the inhabitants, cannot hope to compete with the shops of central Oslo. Nor can the 'suburb towns' expect to be independent of Oslo with regard to employment in the way that the New Towns of Britain hope to become independent of London.

3. Planning and Design. Fundamentally, the conception and design of the 'suburb towns' are based on a modified form of the garden city idea and the neighbourhood concept. Each is fairly homogeneous and self-contained, complete with schools, shops and many of the service and institutional buildings that one would expect to find in a small town, and dwellings are arranged in 'neighbourhoods.' The 'towns' are separated from each other by broad areas of park, fields or woods, and within them the 'neighbourhoods' are segregated by 'green' areas. The latter are not just arbitrarily distributed but form links between the individual 'neighbourhoods' and are connected to the 'turveier' (literally 'tour ways'), a system of greenways which thread their way through the outer residential areas from the edge of inner Oslo to the extensive recreational areas outside the Development Area.

4. The population of the 'suburb towns' varies from 5-6,000 to 20,000. It is dependent upon local conditions, especially topography and certain theoretical standards.

The smallest residential group with the 'town' is the 'neighbourhood.' Three or four of these (i.e., 1,500 to 2,000 families) will, with the present day average family composition, support an elementary school (total 5-6,000 inhabitants). However, this is not considered an ideal size. Three such towns will support a local shopping centre and are a convenient size for a high school. A 'suburb town' therefore, should theoretically contain a population of about 15,000 to 20,000.

5. The population densities vary considerably, e.g., 27 persons per acre at Manglerud, 48 persons per acre at Boler-Bogerud. According to the original plans the 'neighbourhoods' closest to the local centre or suburban railway station, that is within roughly 600 yards, should be quite densely inhabited, i.e., over 100 persons per acre, and the density should decline progressively with distance from the center.

6. The proportion of apartments in the 'suburb towns' is far higher than the Master Plan (published in 1950) envisaged, i.e., over 70%. Theoretically, as already mentioned, building density within each should decrease with distance from the local centres. However, the housing shortage and the desire to reduce costs to the minimum has led the Municipal Finance Department, the final authority in the development of these new districts, to adopt a far more widespread use of the apartment building than originally intended.

7. Walking through a post-war residential unit, seeing the dwellings set in the almost idyllic landscape and noting the sun balconies with their gaily-covered shades and flowering window boxes, one's immediate feeling is that this is the way a modern suburb ought to be. With greater familiarity with other districts in the city, however, one begins to reconsider the first impression. Most of the new districts look attractive and healthy, but one is struck by a certain repetitiveness of the buildings, the layout and even the atmosphere, and a rigidity in town design. It is axiomatic that a town ought to have a character and a degree of uniformity, but most of the new residential districts in outer Oslo possess a uniformity that renders them monotonous or stereotyped. Indeed, it is arguable that there are few actual building groups that are really beautiful or strike the imagination; that much of the pleasing appearance must be attributed to the natural landscape, in particular the vegetation and topography. The blame for this uniformity must be attributed to the preponderance of apartment buildings and the general minimum cost policy. Distinctive variation in layout is hardly possible when buildings must lie as close to the building-line as possible. In some of the 'suburb towns' close to 100% of the dwellings are in flatted blocks; some consist almost entirely of the one type of apartment block built by the Oslo Building and Saving Society. The minimum cost policy and the political difficulty of allocating resources for uses other than housing have also prevented the use of underpasses; and have delayed the landscaping of residential units and the construction of shops, schools and community centres which would diversify the 'townscape.'

Photo: K. Harstad, Oslo

Fig. 1. Bergkrystallen, Blafjellet and Marmorberget Neighbourhoods Lambertseter.

Photo: K. Teigen, Oslo

Fig. 2. Steinspranget Neighbourhood, Lambertseter.

Clark, Forrest D.
EXPERIENCE WITH EXPANSIVE CLAY IN PERU
Civil Engineering, May 1960. Pages 42-44. Illustrations
624.132(85)

1. Forrest D. Clark is the Chief Estimator, Abadan Refinery, Abadan, Iran, who prepared this article from experience as Senior Project Engineer with the International Petroleum Company, Ltd., in Talara, Peru. This article presents an example of what can happen when there is a lack of consideration of the structure and material of the earth upon which a settlement will be built.

2. The action of expansive clay in Talara, Peru, has caused disastrous cracking in thirteen houses constructed there in recent years. Plaster fell from the walls and ceilings, and cracks up to 1/4 inch wide opened in the brick masonry walls. Door frames were forced out of plumb and terrazzo tile floors were cracked and rose in places over 1/2 inch.

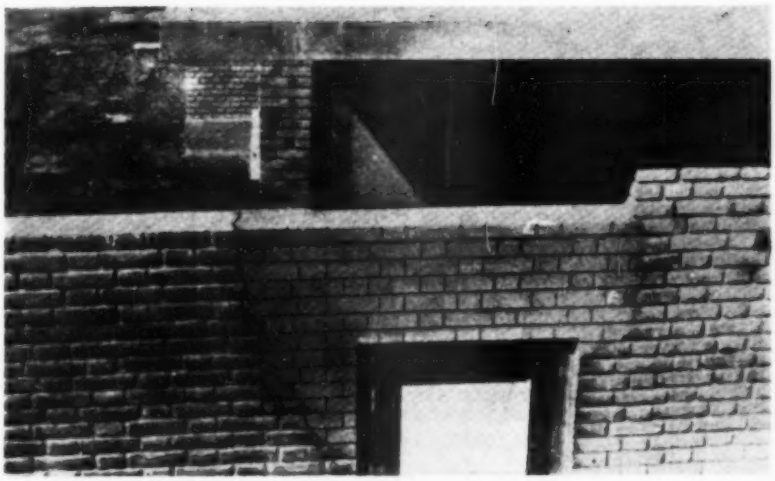
3. Talara, a small town on the Pacific coast of Peru, is in a valley surrounded by a barren clay escarpment which rises to a height of about 150 feet. Most of the valley floor is a deep layer of fine-grained sand, but ridges of clay from the escarpment extend under the sand like fingers. In the past, engineers and constructors who did not appreciate the treacherous nature of the clay, built structures whose footings rested partly on the sand and partly on the clay.

4. Inhabitants of the dwellings of the Petroleum who watered the lawns around their dwellings in this extremely arid climate often discovered that their house would start cracking. On examination of the soil foundation it was discovered that the houses that had damage were often partially resting on clay.

5. A load test demonstrated the ability of the clay to lift a house foundation enough to ruin masonry walls. Also it demonstrated what the clay could do to an unloaded concrete floor slab. Two other interesting facts were noted:

(1) Over 85 percent of the rise caused by each wetting occurred within 24 hours.
(2) After the ground dried out there was no resettlement.

6. Corrective measures consisted of placing an asphalt pavement 3 meters wide (about 10 feet) and a French drain along the outer edge of the asphalt. A lawn has been planted around a house that is so treated. Only a few hair cracks have developed in the house walls and the floors show no sign of uplift pressure.



After the attempt at underpinning, new cracks appeared over the service door of house T-3.

In a futile effort to combat cracking in house T-3, the contractor tried underpinning. He carried pillars of reinforced concrete down about 10 ft to rest on new spread footings.

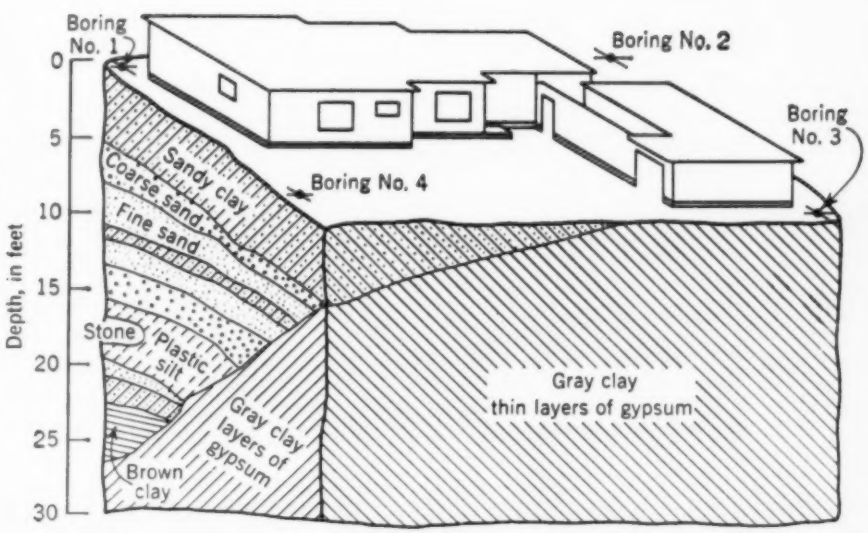


FIG. 1. Soil profile under house T-3 was revealed by borings. Three corners of the house were found to rest on a deep layer of stiff gray clay while the fourth corner stands on fine clay.

Dey, Sushil
THE CRISIS IN COMMUNITY DEVELOPMENT
"Community Development Review" Volume 5, Number 1, March 1960.
Pages 5-9.
711.58 (100) (540)

1. Shri Sushil Dey, who was Development Commissioner, West Bengal, before he left for an assignment first in the United Nations and later in the FAO, has assessed current criticisms of the community development program against its original goods.

2. The authors of community development in India, being persons of great earnestness and scruple, set up an evaluation organization to keep a running measure of the program's progress. This was hailed as a bold and useful device for discovering and checking faults in time. Like the programme itself, its built-in evaluation system attracted widespread attention and admiration outside India. But inside the country the endless post-mortems have provided material for much ill-conceived criticism, creating despondency and distrust which threaten to setback the programme.

3. Evaluation can be a spur to programme improvement and a safeguard against persistence in error. But to accomplish these purposes two requirements must be fulfilled.

(1) It must define the values which the programme sets out to obtain.

(2) It must then construct an accurate scale to measure the progress of this attainment.

4. There has never been an adequate and agreed definition of the value objectives of community development, though there have been occasional references to the ultimate goals in terms of picturesque and poetical imagery. The declared purpose must be a continuously running thread through all the stages of the action by means of which it is to be achieved. One must assure steadfast adherence to this purpose at every step. This means that every element of the programme needs to be subjected to a value test. There can be no true evaluation of community development until one is in a position to carry out such a test.

5. The current evaluation system cannot perform this task, because it is mainly equipped to test not values but concrete performance. This is not surprising, because only concrete performance is quantifiable and measurable. Thus, one can test the degree of success of a programme by taking into account the quantity of fertilizers distributed, the number of new cooperatives established, the miles of roads built, the acreage of land brought under irrigation or improved seeds, the numbers of drains cleared or adults taught to read and write. But none of these accomplishments by itself or in combination can be said to constitute the ultimate purpose which community development is meant to serve. The crucial test is of a different kind, one which will measure progress towards achievement of the ultimate purpose and value-objective of community development.

6. This brings one back to a definition of the values which community development is intended to promote. Values are abstract concepts and therefore difficult to define and still more difficult to measure. Nevertheless, the problem must be squarely faced if one is to attempt any judgment about the effectiveness of the efforts made. The objective in community development was to nourish the urge to grow within the human being and to enable it to have unfettered play. Material development and outside aid are welcome only to the extent that they stimulate and support man's innate potential for growth. The criteria for value judgements can be all derived from this thesis. The programme must be such that it stimulates initiative. This initiative must be forthcoming freely. This means that no programme should move forward until those affected by it have an adequate understanding both of its methods and its targets, and accept these as useful and necessary. Thereafter, the programme should develop only as fast as understanding and initiative can mature. Plans, programmes and targets must flow from this maturity, they can claim no independent validity.

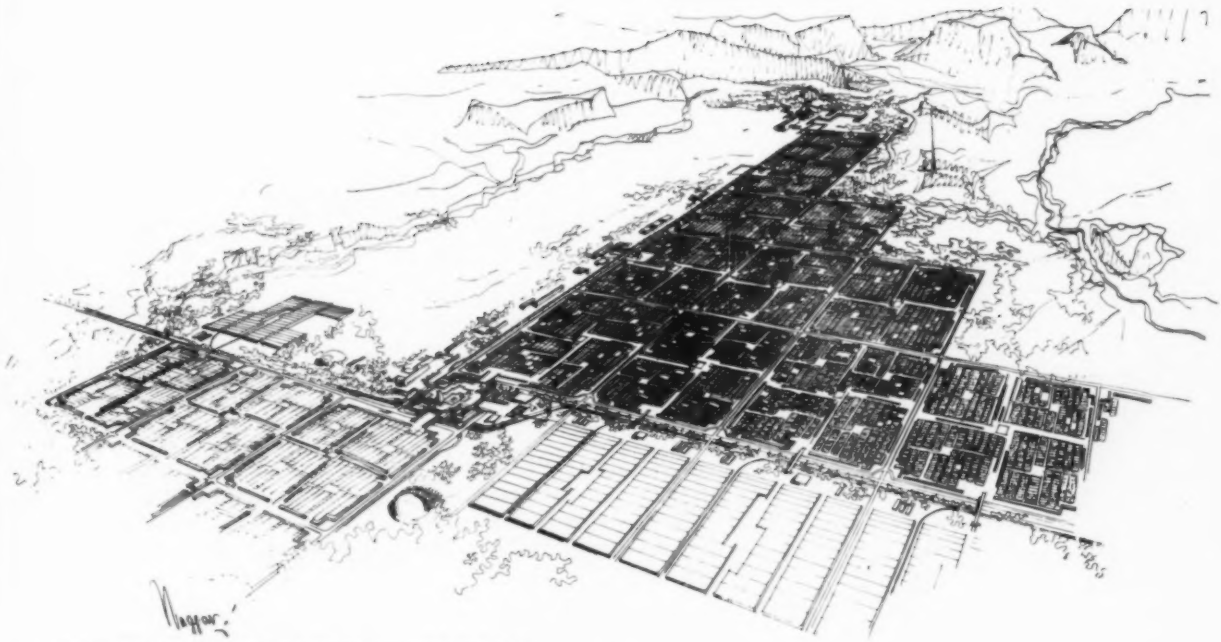
7. These desiderata did not go unrecognised. The emphasis on self help, people's participation, and group action through Panchayats, cooperatives and local leadership is an indication of the importance attached to the human factor in development. The trouble has been that no devices were developed to test the authenticity of these manifestations and a great deal of spurious evidence was accepted through wishful thinking. Labour, mobilised without payment, was not always willingly rendered, and installations and organisations were set up before the people who had to run them had had time to develop adequate understanding and conviction. True indications of success could only lie in these motivations and attitudes which inspired the outward actions of people. These could be ascertained only through patient and sympathetic questioning and observation. There have been sporadic attempts to study such signs, but these have generally been discouraged and regarded as a waste of time.

8. The planners have been in too much of a hurry, and this has been because, notwithstanding lip service to human values, their real concern is to maximize the material output in the shortest time. This may be a laudable ambition, and is particularly understandable in an impoverished country. But if this was to be the primary objective, community development was the wrong method to choose. The logic of community development attaches the utmost importance to material improvement as an indispensable condition and support for human growth. But such economic goals and targets have to be regarded as the means to achieve human ends and cannot claim any significance in their own right. Their role must therefore be always subordinate to the requirements of the ends they serve. It is to be feared that the planners reversed this logic and thus fell into an error. They hoped that the tempo of human growth could be made subservient to the dictates of economic policy. Community development was used as a convenient instrument of that policy and was judged according to its capacity to deliver food grains and contribute to capital formation.

9. Leaps and take-offs are only normal for panthers, acrobats and aeroplanes. If demanded of a capital-starved, population-laden society, such performances must call for a regime in which targets of economic ambition reign supreme and human values are left to take care of themselves. It is to be feared that for the most part, the acquiescence of planners and administrators in community development was an act of shrewdness and not of faith. The programme presented a chance of getting hold of the masses of the planners' own ends. In fact, the shrewdness proved to be shallow, because it is in the nature of community development that the people would not move until they could respond freely with their minds and hearts. Their response would have been slow in any event, but the inordinate expectations led to faulty approaches, distorting the programme and delaying the results even further. Those who have always been sceptical are now quick with denunciations. The continuing and increasing outflow of reviews, evaluations and criticisms, stemming very often from erroneous premises and using inadequate criteria, have added to the confusion and provided a handle to those interested to do damage. Criticism of a programme can serve a constructive purpose only when the basic postulates are beyond dispute.

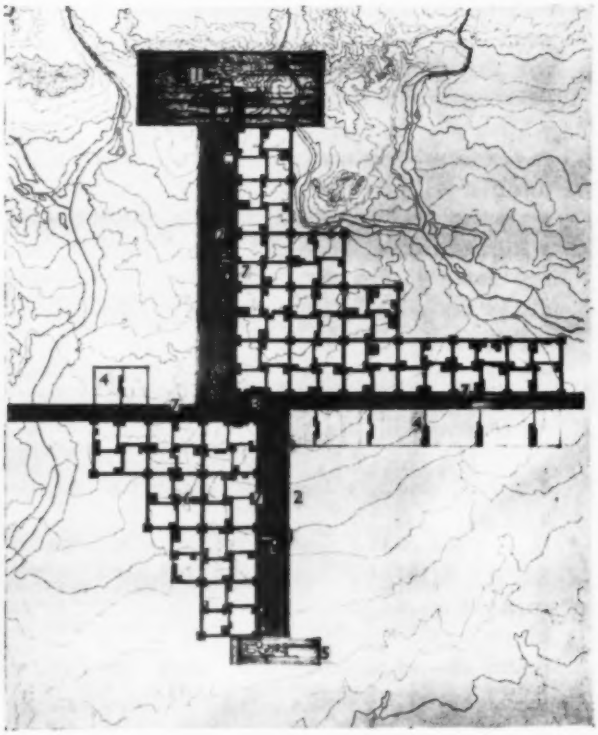
10. Happily, there are still people in India whose faith in community development remains undimmed. These are to be found in all walks of life, but there are more of them in the lowlier stations of the administrative hierarchy which were directly drawn into the programme in the countryside. These have been privileged to see the first faint stirrings of the human spirit which can be evoked under sensitive ministration. It has quickened their imagination, deepened their insight, enlarged their understanding, sharpened their feelings. Having set out to transform the lives of others, they began to perceive the transformation occurring within themselves, and have come to the realisation that development can only be sustained when there is a direct and joyous involvement of those who are intended to benefit from it.

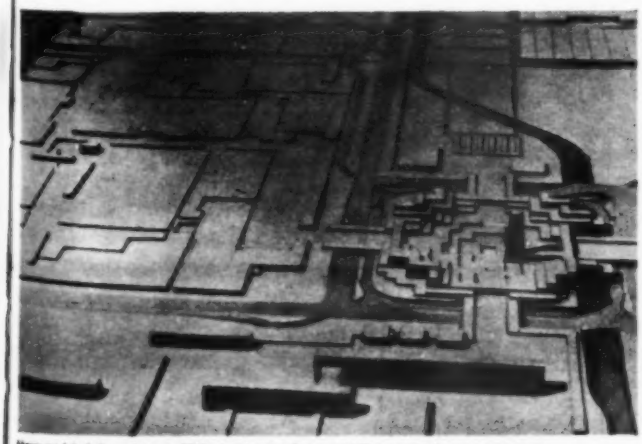
11. It may be considered that these are fine sentiments, but what happens to the food problem meanwhile? Will this slow process of growth be sufficient to produce the 110 million tons of food grains needed annually at the end of the third plan? It may or it may not, but this is the way to make the effort and there is no other. There can be sustained response only when people feel within themselves the urge to respond. Community development is the only way in which that urge can be awakened.



Above: the New City in 2010. Perspective looking north-east towards the Himalayas
Below right: the New City in 2010. General plan showing the use of 'capital design' at the largest scale

Key: 1 *capitol* 2 *public belt* 3 *core* 4 *industrial belt* 5 *university* 6 *residential sector* 7 *major bus trunk lines* 8 *hospital* 9 *stadium*





Above: model of the main core, 2010, showing the Ceremonial Place, outlook tower, transport cores and private commercial and business buildings

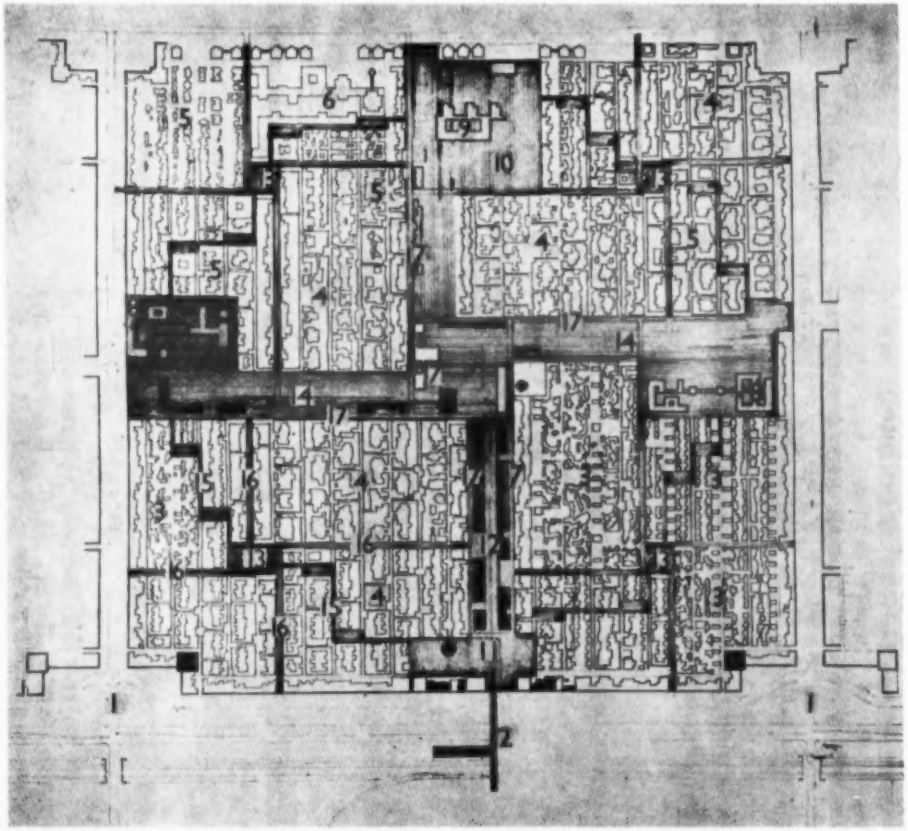
City Planning Department, University of Pennsylvania
THE DYNAMIC CITY
Architectural Design, April 1960. Pages 158-162. Illustrations.
711.1 (100)

1. The work illustrated here was done in the spring of 1959 for a City Planning Studio under the direction of David Crane and Britton Harris.

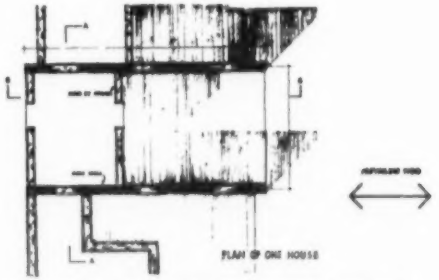
2. The Programme. The students were asked to modify the original conditions for Chandigarh, new capital of the Punjab, India, by assuming (a) nearby raw materials and (b) an early shift from dominant government employment to industrial employment. It was therefore suggested that the main rail line be rerouted 20 miles to pass through the site. A further aim was to create a magnet to counteract the present urbanization trends to the larger cities. An assumed rate of growth of 3 per cent set population goals of 150,000 by 1970 and 500,000 by 2010. Projections suggested that the annual per capita income would have increased 300 per cent by 2010 to $260. These considerations set two objectives: provision for dramatic internal changes able to reflect future standards and economic capabilities, and a resolution of the conflict between emotional and symbolic needs for a capital city and the long-range economic interests of the region.

3. The Scheme. By 2010 the Dynamic City takes the form of an asymmetrical cross. The NE-SW axis is 5.5 miles long, while the transverse axis, parallel to a railway, becomes a lineal city, linking the capital city to a long rhythm of lesser concentrations. The ultimate population occupies a gross land area of about a quarter of that proposed for the 500,000 stage of Chandigarh. This compactness and the cross form permit the concentration which the services of an Indian city need and which are required under conditions of low individual purchasing power, insecure employment and primitive private transport. As 37 per cent of the people will not be able to afford even a bicycle, the scheme is designed for walking and for free mass transit along the two axes. These intersect at a Ceremonial Place with a bus station on the level below and the railway station two levels below. This Place has been developed from its first stage as a mud bowl housing the market to a complex of sculptured earth terraces. Along the NE-SW axis are a series of major public facilities and minor commercial nuclei. On alternative sides of the railway are a series of industries. This belt is paralleled by residential sectors for workers. The public facilities belt is paralleled by residential sectors catering more to government and business workers of all incomes. The Capitol and the University, at the ends of the axis, are further gateways and also its initial traffic generators.

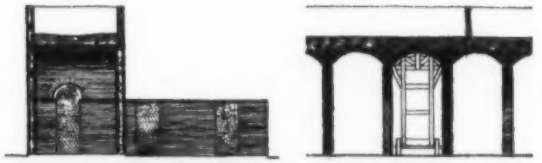
4. Minor streets run NE-SW to channel evening down-slope winds off the foothills. Artificial street canals for the dry season becomes drainage channels in the monsoon. Units of house types are suggested at "court" level (5-10 households) and variations of these are grouped in clusters (1000 households). The densities increase slightly in time to a maximum of 50 households or 250 persons per acre. A basic notion used is that of the "core" house, much used by Doxiadis Associates, and suggested by Charles Abrams for Ghana: the government builds a nucleus, or core, and the individual adds to it in his spare time.



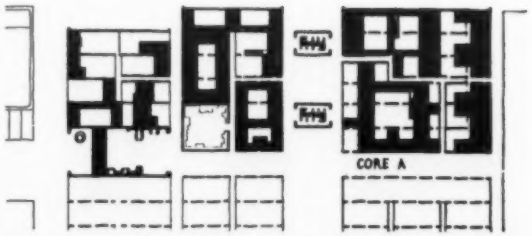
Above: a typical residential sector, 1970, showing control through 'capital design'
KEY: 1 main vehicular intersection 2 overpass 3 planned squatter area 4 aided self-help housing 5 private housing 6 public and experimental housing 7 health—library and community centre 8 elementary school 9 middle school 10 initial position of floating land reserve 11 gateway plaza 12 shops and small industries 13 town building centre 14 inter-sector trunk way for pedestrians and cyclists 15 pedestrian and cycle distributor 16 sub-sector vehicular distributor 17 sector vehicular distributor



Above: one family house plan. Knockout panels in party walls allow for later expansion into the adjacent unit



Above: long and cross-section showing the trunk-chassis shuttering for mass production of sun-dried earth brick roof arches, and the use of earth for insulation, and the roof surface for extra living space



Above: various patterns of shelter unit or lot regroupings. The open spaces are communal

School of Architecture, Pratt Institute
METHODS OF REDUCING THE COST OF PUBLIC HOUSING
Architecture and Engineering News, April 1960. Pages 19-23.
333.322 (100)

1. This is an abstract from a synopsis of a study conducted by the School of Architecture at Pratt Institute, Brooklyn, New York, under the sponsorship of the New York State Division of Housing. This graduate student project, under the direction of Professor John H. Callendar with the assistance of Giles Aureli, investigated five major areas: planning and building layout, structure, exterior envelope, interior partitions, and mechanical equipment.

PLANNING AND BUILDING LAYOUT

2. Of the several plan types which were explored by the Pratt Institute research team for possible economies, three were selected for detailed study:

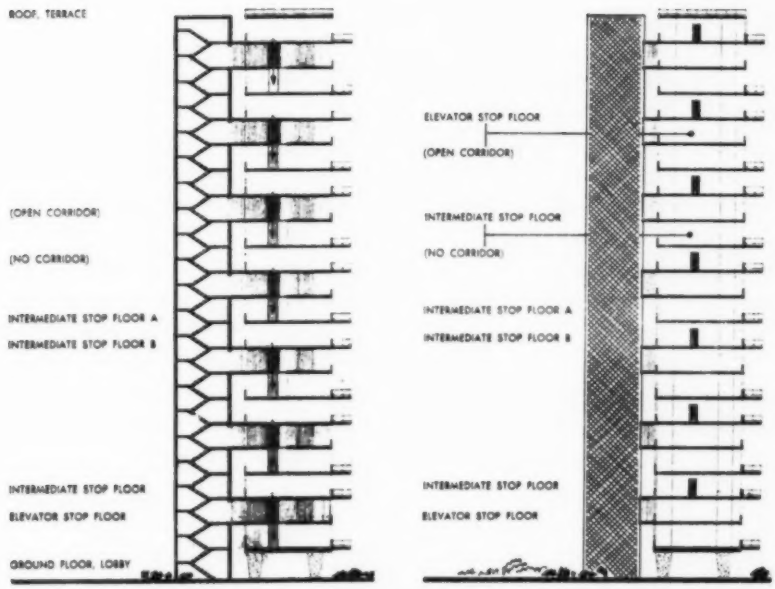
a. Tower scheme
b. Open-corridor scheme
c. Interior-corridor scheme

None of these plan types can be considered new or radical. They have all been used for low or middle-income housing for at least a decade.

3. In each of three plan types the following departures from current New York City public housing practice have been incorporated:

a. Regular column spacing
b. Full distribution of apartment sizes in one building
c. No basement.

4. Tower Scheme. This is the name given to a plan type which is approximately square, with the rooms disposed around all four sides of a central service core. It has a number of advantages and one serious disadvantage. It is readily apparent that the compact plan results in a minimum of perimeter construction and the shortest possible utility runs. Even more significant is the reduction in the amount of expensive public corridor space; in the tower scheme the area of public corridor per construction room is about half that in the interior-corridor scheme. A serious economic handicap is the high cost of elevators. Providing only four to six apartments per floor, as compared to ten to twelve apartments per floor in the interior-corridor scheme, the cost of elevators per dwelling unit is thus two to two and one-half times higher in the tower



OPEN CORRIDOR SCHEME—left shows cross-section through the elevator tower. Right shows cross-section through the open-corridor. This skip-stop scheme saves cost of two out of three corridors and elevator doors and controls.

Perspective study showing a housing project utilizing an interior-corridor scheme. Economies are possible utilizing two-column cantilever system. Simple scheme is now in com-con use for low and middle-income housing.

scheme. However, this scheme is presented here in the belief that the advantages will offset the higher cost of the service core, thus affording the improved livability of this type at no increase in cost.

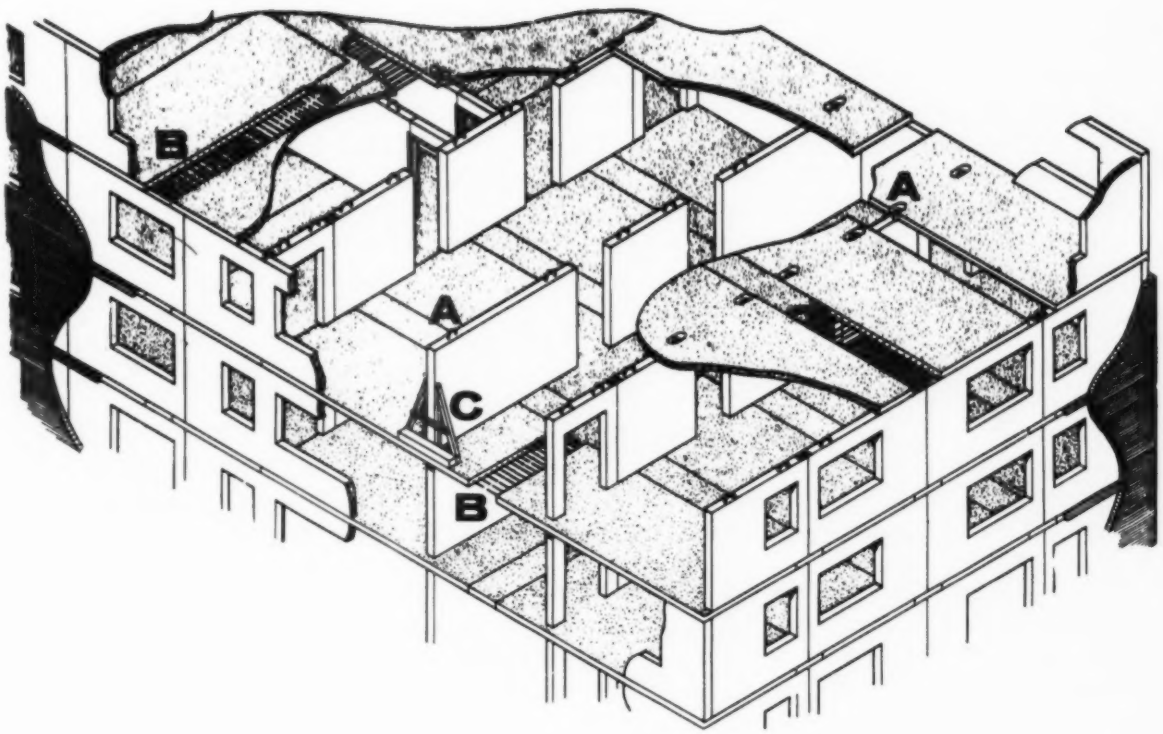
5. Open-Corridor Scheme. In this type of building all of the apartments are reached by means of outdoor corridors or "elevated sidewalks," as they are sometimes called. The characteristic shape of such a building is long and thin. Improved livability is the outstanding advantage of the scheme. Every apartment has through-ventilation and two exposures, and every apartment can have the most favorable orientation. The interior corridor, which in practice is often an unpleasant space is eliminated. These gains are partially offset by some loss of privacy for the rooms that open on the corridor. A greater disadvantage is that the open-corridors, being "single-loaded," must be at least one and one-half times as long as interior corridors. The open-corridor, of course, need not be heated but some provision must be made for snow removal in cold climates. The long, thin building shape with its high proportion of perimeter to enclosed area, is not basically economical, nor, in a high rise building, is it basically stable; extra cost for wind-bracing must be assumed.

6. In view of all items noted, it might be concluded that the economic position of the open-corridor scheme is unfavorable. But this is not always the case. In the illustrations, the open-corridor scheme has been combined with skip-stop elevators. In this arrangement, the elevators stop only at every third floor; tenants on the intermediate floors have to walk up or down one floor. The open corridor occurs only at elevator stop floors. All apartments open off the corridor; stairs are within the apartments and are maintained by the tenant. This saves the cost of two out of three corridors and elevator doors and controls. Against this must be balanced the cost of private stairs and the fire escape balconies in two out of three of the apartments. A significant advantage of this scheme is the solution of most of the privacy problem.

7. Interior-Corridor Scheme. It is a simple and economical scheme, permitting ten to twelve apartments per floor. It does not, however, provide cross-ventilation except for the four corner apartments.

STRUCTURAL SYSTEMS

8. Two Column Cantilever System. This refers to a reinforced concrete flat plate construction having only two longitudinal rows of columns instead of the usual four. Floor slabs cantilever out beyond each row of columns and support the walls, which should obviously be as light as possible since the elimination of many columns and the reduction of foundation loads seemed likely to result in over-all economy. Structurally, the double-cantilever design is highly efficient because bending moments at columns and at midspan are nearly equal, resulting in less reinforcing steel and less concrete per slab.



Isometric cut-away view of current New York City housing project utilizing box-frame construction. View shows precast load-bearing walls and precast floor slabs in their relative positions. For clarity, all other partitions have been omitted. Shown are specific jointing techniques used between various type slabs and position of these joints. "A" indicates lifting rings later grouted to anchor wall panels to floor panels. "B" indicates poured filler strip (bars exposed in precast floor slab to permit strong bond). "C" indicates temporary shoring for free-standing wall slabs.

9. Lift-slab Construction. Reinforced concrete flat plate floor slabs poured on the ground, one on top of another, and lifted into place by the patented "lift-slab" technique. Columns are assumed to be steel, but may be precast concrete. This has become an accepted method of erecting a structure in the safest and most economical way. Lift-slab is a proprietary system of construction relies on under-bidding poured-in-place concrete construction for its existence.

10. Box-frame Construction. A frameless construction of precast concrete slabs, applied both horizontally and vertically. By eliminating all columns and beams, and most of the formwork and scaffolding, it seems likely to effect notable economies. The advantages include the ability of the system to resist any wind forces acting upon it. Each wall acts as a solid plate, stiffened by the floor system. Long range savings also occur in maintenance. Such common repair problems as cracked partitions, sprung doors, damaged window frames and the like, resulting directly from the movement of the structure are eliminated. The structural elements in themselves are fire-proof. Foundation problems, where soil does not have much bearing capacity, are greatly improved because the total load of the building is distributed over a much larger area. In the system there is also the added advantage that the bearing walls between the apartments give excellent sound insulation (60 decibel reduction for a nine-inch wall).

11. With development of pre-casting techniques, the economies and other advantages of the box-frame became obvious. The virtual elimination of form-work is one of the first cost savings involved. Mass production of the structural components, the pre-casting of standard size units, either factory-cast or cast-at-the-site, is another cost saving feature. The ease of erection of the pre-cast units greatly reduces construction time and thus reduces the cost of the structure. Whole sections of exterior walls as well as partitions and floors can be erected and placed in record time.

12. This system of construction is based on the theory that vertical members, which outnumber and are larger in total area than horizontal elements, might logically be precast with considerable economy. In the standard skeleton frame construction, all loads are transferred from floor slab to beams to girders to columns and thence down to the foundation. The loads are concentrated at each column. In the box-frame walls and partitions carry the load of the floor slabs without the use of columns or beams. Vertical panels are lifted into place by a crane, set on a bed of mortar and held in position with braces. Steel lifting eyes in the top edges of the panels provide anchorage when the floor or roof slab is lowered into position. The weight of this total structure is reduced by the use of lightweight concrete.

13. Light-steel Framing. The use of bar-joists, junior beams, and cold-rolled sections has proven to be more economical than reinforced concrete construction in many cities. Some advantages are as follows:

a. It is a fire-resistant construction;
b. Light in weight, thereby decreasing foundation loads as well as facilitating the handling and placing of members;
c. Goes up faster, and uses less field labor (particularly in forming) than most other structural systems;
d. Contractors take minimum risk in this kind of work, because almost all elements are prefabricated, not field manufactured;
e. Because of the open-web construction, space is available for the passage of pipes and electrical conduit. This will result in lower costs for the electrical and mechanical trades. It will also enable the running of unsightly steam risers and returns under floor to a central point;
f. Material is non-rotting and termite proof;
g. Standardized in dimensions and in carrying capacity.

14. Non-fireproof Construction. This refers to wood or bar joist floor construction on masonry bearing walls. It is flexible enough to find application in almost any over-all shape desired. In projects where high-rise dwellings are felt to be necessary, the introduction of some non-fireproof medium-rise buildings should be considered, not only from the point of view of cost savings, but because they introduce a more human scale into an otherwise titanic building grouping. They also create a visual area of transition between an area of high-rise buildings, and the surrounding neighbourhoods.

15. A minor disadvantage is the necessity of placing fire escapes on the exteriors. As a rule, they are adverse visual elements, deterrent to privacy and a temptation to burglars. Another drawback is the problem of vermin, since both floor and partition construction are hollow. These drawbacks can be alleviated somewhat by a more aesthetic handling of the escapes with new materials and the incorporation of color into the design. Protection against intruders can be provided by a judicious placing of fire-escape balconies at windows which can be locked and curtained for privacy. Pest control cannot however be "built-in" into this system.

Muhsam, H. V.
POPULATION DATA AND ANALYSES NEEDED IN ASSESSING PRESENT AND FUTURE HOUSING REQUIREMENTS
United Nations Seminar on Evaluation and Utilization of Population Census Data in Asia and the Far East, 20 June - 8 July 1960, Bombay, India. Mimeographed Paper. 28 Pages.
312: 333.322.6 (100)

1. H. V. Muhsam of the Hebrew University, Jerusalem, Israel, first prepared this document for a Seminar in Latin America in November 1959. He then revised it for another UN Seminar in India. Further papers of this seminar will be abstracted in subsequent issues of EKISTICS.

2. Some Economic and Demographic Characteristics of Housing. Together with food and clothing, housing satisfies the basic physical needs of every human being. But these three types of good differ in their economic character. Food is the consumer good par excellence and clothing may be classified, in general, as a semi-durable consumer good, while shelter, except in a few primitive societies, is one of the most durable investment goods. But unlike other investment goods, such as machinery, housing does not serve directly for the production of other goods and services.

3. The fact that a large part of the national stock of housing is handed down from generation to generation means that the number of new housing units required each year is not simply proportional to the size of the population, like the needs for food and clothing, but is affected to a large extent by the annual increase of the population. Obsolescence, dilapidation, destruction and many other factors also obviously enter the equation; but population trends have a much larger influence on the need for new housing construction than they have on the needs for most other goods and services. And as a major share of the nation's capital is ordinarily embodied in its housing, population trends, through their effect on the need for new housing construction, may become of considerable importance in determining the nation's capital requirements and the disposition of its capital resources.

4. Housing also differs from most other goods in that it is seldom used by an individual, but ordinarily by a group. The group which shares housing accommodation--the household--is usually the elementary unit of social organization, which may be the biological family, the "joint" or "extended" family, or a different unit, depending on the traditions of the society. Conversely, in the case of shelter, only one unit, with few exceptions, is required for each group of users. Hence, population changes affect the need for housing primarily as they are manifested by changes in the number of families or other groups which share housing accommodation, although changes in the size and composition of these groups have a considerable effect on the size and other characteristics of the housing units required.

5. Another important characteristic of housing is its immobility. Because of this characteristic, not only does any increase in the number of families or other groups in the nation create a need for additional housing, but even changes in the geographical distribution within the country of a population not showing growth have an important bearing on needs for new house construction.

6. Certain peculiarities of the construction industry are likely to complicate the problem of correcting imbalances between demand and supply of housing. If the volume of housing construction contracts as a result of war, inflation, economic crisis, restriction of credit, or an unfavorable trend in the relation between construction costs and rents, it may prove difficult subsequently to achieve the expansion necessary to eliminate a housing shortage. As a result of the slackening of construction activity, skilled construction workers may drift into other occupations and investment funds may be diverted into other channels from which it may be difficult to bring them back to the building trade. The housing shortage may result in the imposition of rent controls which make investments in new construction unprofitable. Even if controls are relaxed or new housing is exempted from their application, most of the existing units may become financially amortized, technically outdated, and therefore cheaper than new units, to such an extent that few families can afford to buy or rent new housing in spite of their need.

7. In many countries, especially those which are under-developed, there is a great difference between the problems of housing in urban and in rural areas; this is primarily because most rural housing is constructed by the users themselves, possibly with the assistance of neighbours, whereas, in the city, construction is typically a separate industry. It is also of importance in this connexion that a major part of urban housing, unlike rural housing, is rented instead of being occupied by its owners. The problems considered in this paper are primarily those of urban housing.

8. It is understandable that the public authorities cannot remain indifferent in the face of a severe and persistent shortage of housing, or even the threat of it. Thus, the establishment of a policy in regard to housing and the actions taken to implement the policy may become important elements of social and economic development programmes.

9. Present Housing Needs and Supply. The censuses should provide as a minimum, information on the number of households by "class" (i.e., private or institutional) and size, and of housing units by "class" (private, including permanent, rustic, mobile and improvised; collective, such as hotels, institutions, camps and housing units not intended for habitation, such as caves, etc.), number of occupants and number of rooms--each for various geographic or other relevant divisions of the country.

10. In order to judge the adequacy of available housing, some standards must be introduced. For example, these two criteria may, in many circumstances, be accepted:

a. Each social unit--the family or the household--should dispose of a separate dwelling;

b. Each dwelling should be large enough to allow a fair amount of space and a certain degree of privacy for all occupants, and it should offer the necessary facilities and adequate shelter against unfavourable climatic conditions.

11. If the provision of a separate dwelling for each family or household is accepted as the standard of adequacy, the question arises, how to determine the present number of families or households. It is not sufficient to consider the number enumerated in the census, because many of the census households, sharing the same dwelling, may be made up of two or more groups that should be housed separately according to a socially acceptable standard. It is therefore necessary to inquire into the composition of the groups enumerated in the census as households.

12. The second problem in assessing the need for housing is that of determining the size of dwellings required. The "number of rooms" is the only indicator of size mentioned in the proposed list of items to be included in a housing census. Obviously, for an adequate measure of size of units, information is also required about floor space, cubic volume, number and size of windows, and whether all rooms can be reached from the outside without passing through another room which is not a joint living room, kitchen, lobby, etc. These data are difficult to obtain in a census; they may possibly be obtained by intensive sample investigations.

13. The minimum size of the dwelling required by a household can be determined either with regard to the number of rooms actually occupied by households of corresponding size and composition, or with regard to some accepted standard. The following procedure should not be objectionable. From census data information is extracted relating to households which, in view of their composition and the accepted standard, can be satisfactorily accommodated in a single dwelling, and the size of these dwellings is determined. This size, in the form of an average or a distribution, is then also applied to the groups of the population which actually do not occupy separate dwelling units but should do so, according to the standards. Thus an estimate of the number of rooms required by the population can be obtained which is based on standards with respect to the number of dwellings, but on the actually prevailing habits according to census data, with respect to the size of these units.

14. A simple standard for the size of a dwelling unit would be a fixed ratio between the number of rooms and the number of persons, such as one room per person, for instance, unless it is possible to base the standard on a simple measure of floor space like the number of tatami (mats of standard size used to cover the floor from wall to wall) accepted for this purpose in Japan.

15. The Future Need for Housing. As the need for new housing is related to household formation rather than to population increase as such, it appears to be preferable to find some indicator of expected future household formation and to base estimates of housing requirements on such an indicator, though it may be rough, rather than to rely on total population figures.

16. A relatively simple method of estimating the future trend in the number of dwellings required is to use census data on the population and numbers of household heads classified by sex and age groups, together with future population projections by sex and age group. The number of household heads per thousand population of each sex-age group at the census date is calculated, and this ratio is applied to the projected future population figure for the corresponding sex-age group. The sum of the results for all sex-age groups, compared with the total number of household heads at the census date, provides an index of the future increase in the required number of dwellings, so far as it is affected by the projected growth and changing sex-age structure of the population. If an estimate of the deficit of dwellings at the census date has been made, this may be added to the increase in needs indicated by the projection for the future, in order to estimate the total number of units required to house the population satisfactory at the future date.

17. The results of such calculations relate only to the future trends in the numbers of dwellings required, without regard to their size. A procedure based on the same principle as the method described above, requires that the numbers of household heads according to a census be cross-classified in the census by sex, age, and number of rooms (or other measures of size) of the dwellings' units which they occupy. This is relatively difficult to obtain. Ordinarily it would be less difficult to obtain a cross-classification of the number of persons or of children in the household, than of the number of rooms, with the sex and age of the household head. Given a cross-classification of the latter type, together with a tabulation of dwellings by number of rooms in relation to the number of occupants, it is possible to estimate the distribution by number of rooms occupied, for households headed by persons of each sex-age group.

18. In using forecasts of housing needs obtained by any procedures like those described above, many precautions have to be taken. First, there is the problem of taking into consideration the effect of delapidation, obsolescence and ultimate destruction of the existing stock of housing. The collection of information on the ages of existing houses is suggested to be included in a housing census on a second-priority basis. Such data, in conjunction with a life table for houses, which could also be established on the basis of census-type information, could be used to estimate the expected attrition of housing supply in each future period.

19. Second, if one is not interested in a mere appraisal of the situation at a given moment, present or future, but wishes to consider the transition from the present

situation to a future one, one must take into consideration the dynamics of the phenomenon and should not restrict the study to the juxtaposition of a series of instantaneous observations. A differentiation between growing, stationary and shrinking families or households will be helpful in taking into account the dynamics of demand for housing. It is obvious that the population census cannot provide directly a classification of growing, stationary or shrinking households or families; but estimates can be made by reference to such characteristics as marital status and age of the household or family head, or the duration of marriage of the head of the household. The problem of growing, stationary and declining households is particularly disturbing in forecasts of housing needs based on estimates of family formation and dissolution.

United Nations, Economic and Social Council
PRELIMINARY REPORT OF THE UNITED NATIONS SEMINAR ON EVALUATION AND UTILIZATION OF POPULATION CENSUS DATA IN LATIN AMERICA
United Nations Seminar on Evaluation and Utilization of Population Census Data in Latin America, 30 November - 18 December 1959. Santiago, Chile, Mimeographed Paper. 27 January 1960. 87 pages. 4 annexes.
312 (100)

1. EKISTICS has abstracted several papers from this conference during the first half of 1960. The main conclusions are now presented, which tie together the papers and the ideas presented during the seminar. Following on with the important subject, EKISTICS will begin abstracting major papers from the Seminar on Evaluation and Utilization of Population Census Data in Asia and the Far East, 20 June - 8 July 1960, Bombay, India.

BASIC NEEDS FOR INFORMATION AND ANALYSIS.

2. Only a continued study of the interrelations between population trends and economic and social factors will make it possible to build up the basic knowledge necessary to forecast the future evolution of populations. Such knowledge is particularly necessary in the Latin American region where rapid population growth is taking place at the same time as far-reaching changes in population, distribution and economic structure and the countries of the region are making unremitting efforts to overcome the difficulties hampering the more effective use of human resources and means of production with a view to achieving higher levels of living.

3. The Seminar considered it essential that census plans should include a basic programme of research, taking into account the fundamental requirements of economic and social development programmes. This is the only way of ensuring that the fullest possible advantage is taken of the census operations which involve great expenditure of effort and are undertaken at relatively infrequent intervals.

4. Population projections were considered one of the most valuable instruments which demography can contribute to social and economic planning and to the formulation of bases for demographic policy. In addition to the future figures for the total population, it is necessary also to consider figures for the country's administrative divisions for economic and natural regions, for cities of various sizes, and for the urban and rural sectors. Projections should also be made for sectors corresponding to various population characteristics such as sex, age, economic activity or marital status, which have to be taken into account in order to obtain more accurate knowledge of future human resources, and the population's future needs with regard to housing, food, educational facilities, employment opportunities, etc.

5. The Seminar considered the usefulness of census data for the preparation of models of economic and social development, emphasizing the importance of population projections as part of the data required for the formulation of models taking account of demographic factors. During the discussion of this topic, attention was drawn to changes in the speed of growth of per capita national product resulting from the accelerated rate of population growth.

6. Occupation and Employment: The Seminar recognized the fundamental importance of information concerning the size, structure, distribution and evolution of the economically active population in planning economic development. It was accordingly considered essential that the census should provide a statistical inventory of the country's labour force in terms of its structure by branches of activity, occupation and status in employment. It was pointed out that there are still large gaps in knowledge of this aspect of population and that a census is not always enough to obtain all the necessary information, especially with regard to unemployment and under-employment. Information on these last characteristics is urgently needed and the population census can provide valuable data on those subjects. Nevertheless other sources of information should be developed. Attention was drawn to the importance of calculating labour force participation rates by age and sex, for both rural and urban sectors and for the principal cities in order to provide the necessary bases for the relevant projections. Finally, it was suggested that in countries experiencing the structural changes involved in a programme of economic development it may be necessary to undertake studies of the economically active population and its composition in the intervals between censuses.

7. Standard of Living: Consideration was given to the use that could be made of census data in the estimation of various demographic indices which could be used in conjunction with indices of other kinds, to assess the level of living of the population. It was considered that such indices might be extremely useful in assessing changes occurring in the general level of living and its components over time or in the various regions of the country, as a result of economic and social development. The main characteristics of such indices and the desirability of using the greatest possible number of them to obtain a more complete estimate of the general level were pointed out.

8. Spatial Migration: Although the Latin American countries for the most part have not expressly adopted demographic policies, they have taken and are constantly taking measures which directly or indirectly affect the growth, composition and spatial distribution of the population, such as laws regulating international immigration and emigration; health, education, land reform programmes, etc. In practice there is little information concerning the demographic effect of such measures and their consequences for the economic and social development of the countries concerned. It was accordingly considered essential to make the fullest possible use of census data in order to evaluate the effects of these measures and as an element in future policy-making. It was suggested that the two main aspects on which demographic policy in the Latin American countries should concentrate were spatial distribution and rapid population growth. In the discussions on the first aspect, there were

references to the low density combined with uneven distribution and the high degree of urban concentration in most countries in the region. With regard to the second, reference was made to the effect of the high and almost constant rates of fertility in contrast to the decreasing mortality rates. This points to the need for greater knowledge of the economic, social and cultural and other factors associated with a country's migration and fertility patterns.

EVALUATION OF DEMOGRAPHIC STATISTICS.

9. It was considered that relatively little had hitherto been done in the region to evaluate census data, although evaluation is essential to provide a solid foundation for the preparation of population projections and other studies based on demographic information. Attention was drawn to the need to include in the census plans a programme for evaluating the completeness and quality of census information and at the same time for evaluating vital records with a view of obtaining a broad view of the adequacy of the two main sources of demographic information and achieving the best estimate of the components of population growth possible, given the circumstances in the country concerned.

10. Use of Sampling. Attention was drawn to the use of sampling in:

a. testing census material and methods and the quality control of data processing;
b. evaluating the completeness and quality of census data by means of field checks or by comparison with vital records or other sources;
c. reducing the time and cost of the basic tabulation programme;
d. making provisional tabulations;
e. enlarging the scope of tabulations;
f. enlarging the scope of the census itself;
g. carrying out post-census investigation.

11. Co-ordination of Census Data with Vital Statistics. It was recognized that census data and vital records must be closely co-ordinated so that fuller use can be made of the information collected by both processes. This means that efforts must be made to achieve the greatest possible uniformity in the definitions, concepts, classifications and tabulations common to both censuses and vital records. Close co-ordination would facilitate the reciprocal evaluation of characteristics recorded in both censuses and vital records, as well as other sources.

BASIC PROGRAMME OF DEMOGRAPHIC RESEARCH.

12. It was pointed out that much of the little information already collected has not yet been fully utilized, and that the additional information provided by the 1960 censuses would be soon available. If census information is to be fully utilized for purposes of planning and economic and social action, a basic programme of research, which should

constitute an integral part of the census plan, must be envisaged from the outset in planning censuses. This would mean, inter alia, the preparation of suitable tabulations to obtain the necessary information to make the analyses required, and the allocation of funds and personnel to carry out the programme of research. It was pointed out that a programme of research should take into account the most important needs of the countries concerned and in the interest of efficiency and usefulness should be undertaken jointly by the various bodies interested, e.g., the census office, economic and social planning bodies, university research institutes, etc.

13. Tabulation Programme of the Population Census. The participants supported the Inter-American Statistical Institute's recommendations for the programme for the 1960 census of the Americas with regard to the content of the questionnaires and tabulations. It was pointed out that in adapting international standards to national needs, the provision of essential information required for national planning and action purposes should receive special attention in each country.

14. Organization of Programmes for Evaluation, Analysis and Utilization of Population Census Data. The Seminar thought it desirable that the producers of basic information, the producers of the analytical studies based on that information, and the consumers of those analytical studies, should all participate in the formulation and execution of an integrated programme.

15. The Seminar took the view that at least the initial stage of analytical and interpretative evaluation of such programmes should be considered as an integral part of a national census plan, whether carried out by the census office concerned or by some other body engaged in demographic research.

16. The Seminar, when examining measures which might be adopted to facilitate the carrying out of a programme of evaluation, analysis and utilization of population census data, considered that the following, inter alia, might be of assistance in achieving this end:

a. The establishment of a permanent census office;
b. The provision of adequate facilities for tabulation and publication of results;
c. Availability of personnel trained in demographic analysis and,
d. Adequate financial resources.

17. International Co-operation. It was suggested that if the census were to make the fullest possible contribution to planning and policy-making in the individual countries, it would be necessary to arrange for co-operation between the countries with regard to the evaluation and analysis of the results of their census programmes.

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